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The college investment decision for nontraditional students: Factors affecting the choice of postsecondary enrollment and quality

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The College Investment Decision For Non-Traditional Students:

Factors Affecting the Choice of Post-Secondary Enrollment and Quality

by

Shahram Amiri

Submitted in partial fulfillment of the requirements of the Degree of Doctor of Higher Education Administration

School of Education
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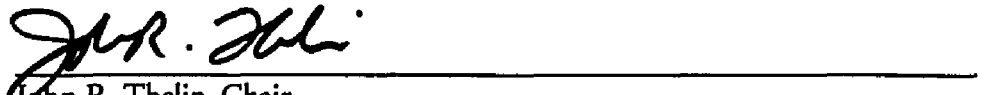

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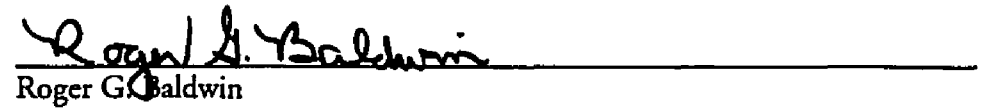

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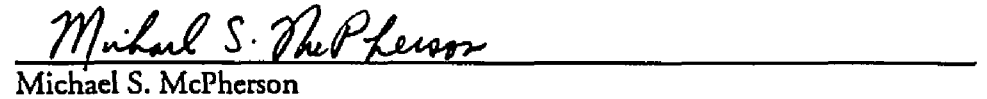

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Abstract

As the shift in demographics and the aging population of the United States make their presence felt, colleges and universities throughout the country must address the question of supporting the goals of the non-traditional student in higher education. While it is difficult to characterize a "typical non-traditional student," it is important to analyze the role that certain demographic factors play in the student's decision to go to college.

We hypothesize that the non-traditional student's decision to attend college is influenced by several factors that, in broad, general terms, include family background characteristics, the student's demographic profile and aptitude, and external economic conditions and labor demand.

The influence of family background is incorporated in our model through variables that describe the environment in which a student has grown up. Parental educational attainment, in particular, serves as a proxy for the attitudes toward education that may have shaped the student's perceptions toward higher education. Other factors such as parental income, the father's Duncan socio-economic index, the number of siblings, and the birth order, describe the family's capacity to invest in higher education. In short, the factors hypothesized to influence student enrollment were indeed shown to have the predicted effects.

By understanding non-traditional students and what influences their enrollment decisions, we will have a better understanding of how to serve this growing segment of the population within higher education. In particular, by determining the type of institutions that these students enroll in, institutions themselves can be made more aware of the particular needs of these students so as to be better able to meet them.

Table of Conents

Chapter 1

Introduction

As the shift in demographics and the aging population of the United States make their presence felt, colleges and universities throughout the country must address the question of supporting the goals of the non-traditional student in higher education. No longer is the typical student one between the ages of eighteen and twenty-two. In 1983, over one-third of all college students were over the age of twenty-five. The United States Department of Education's National Center for Educational Statistics (NCES, 1992) completed a study of college enrollments from the fall of 1970 through the fall of 1987 that supported projections that by the year 2000, there will be an excess of 20 million adult students (Betters-Reed, 1980). Ross and Hampton argue that in 1991, non-traditional students represented over two-thirds of all undergraduate students attending post-secondary institutions. Between 1970 and 1985 the participation rate of those 25 and older increased by 114%, compared with a 15% increase by younger students (Villella and Hu, 1991). Furthermore, Brodzinski (1981) claims that by 1995, "there will be a twenty percent drop in the number of eighteen-to-twenty-four year olds from the 1980 levels" (p. 1).

The NCES study corroborates our emphases on the burgeoning impact of non-traditional students in higher education. Cited here in Figure 1.1, the study displays the rapidity with which non-traditional students are entering institutions of higher education. The study's comprehensive enrollment data and estimations to 1990, as well as its projections to 1997, are particularly relevant when one notes the students who are 25 or older. The sharp rise in their rates of participation in higher education signals that they will likely have the greatest impact upon postsecondary learning in the coming years.

What is surprising, therefore, is the paucity of literature on the goals and motivations of the non-traditional student. Existing studies tend to focus more on non-traditional retention and financing. There is insufficient research to determine what influences the non-traditional student's decision to go to college and his or her selection of institution. As Freeman and Holloman observed in a 1975 article, "Our knowledge of enrollment decisions of older people is currently limited" (p. 27). Such an honest evaluation is just as apt today as it was nearly twenty years ago.

While it is difficult to characterize a "typical non-traditional student," it is important to analyze the role that certain factors play in the student's decision to go to college. Are there major differences between males and females? Is race a factor? What influence does the family's socioeconomic background have on the decision to go to school as an older student? Marital status, number of children, and current employment must all be examined to determine their role in the process. Moreover, the person's life experience in the formative years after high school may greatly affect his or her willingness and desire for further education. Among non-traditional students who decide to attend college, what determines who goes on to four-year or two-year institutions? Finally, what influences the quality of the school chosen?

Some of these questions have been posed with regard to the traditional student by Behrman, Kletzer, McPherson and Schapiro (July, 1992). As more and more non-traditional students fill America's colleges and universities, such questions must be answered for them as well, so that the American higher education system will be better prepared to assist them. Unfortunately, very little research has been done in this area and much of what exists is already out of date. An important goal of this study, then, is to address this fundamental question by initiating research on the non-traditional student in the context of the current fiscal and educational environment.

The situation most colleges and universities faced was much different twenty years ago when the Carnegie Commission released its 1973 report, *Priorities for*

Total Enrollment by Age

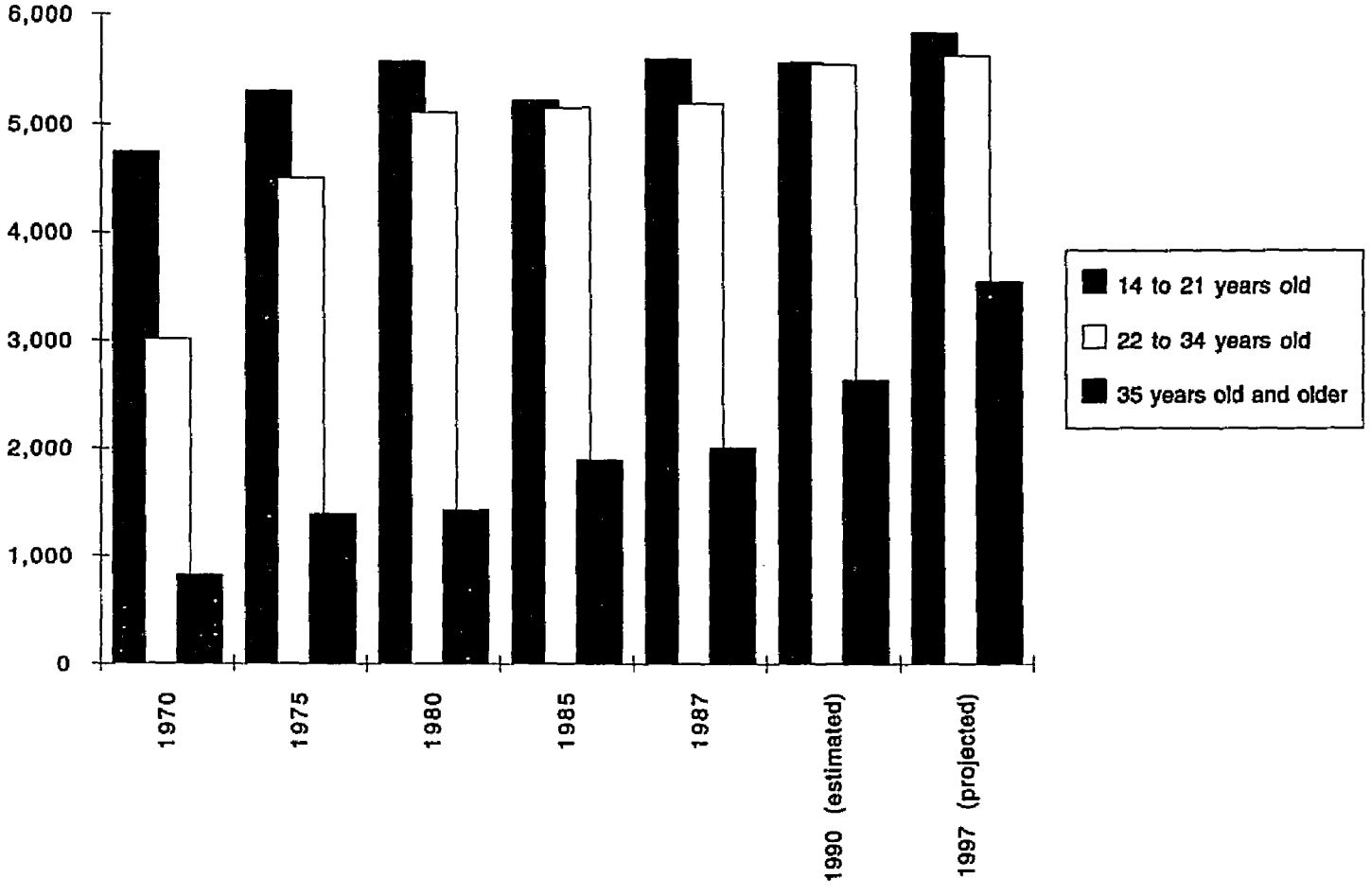

Figure 1.1

Source: *Digest of Education Statistics 1992*

Action. Projecting that demographic changes would alter college enrollment, the Commission expressed the hope that the non-traditional student would fill the classrooms emptied by the shrinking eighteen- to twenty-four-year-old cohort. For this to happen, colleges and universities had to reconsider their systems and services to ensure that they were prepared to assist the non-traditional student. Many scholars believed that institutions threatened their own existence if they were unwilling to adapt to the forthcoming changes. Gilford's 1975 statement embodied this sentiment:

> Higher education will no longer be a growth industry unless an entirely new constituency can be attracted to its institutions, and unless continuing education becomes an accepted pattern in our society (p. 6).

Much has changed since then. Although the number of college-eligible high school graduates has dropped to the lowest number in years, current trends predict an increase for the years ahead followed by a gradual leveling off. The adverse demographic impact that was projected twenty years ago has been avoided largely by increasing rates of enrollment, especially of adult students. Moreover, the fundamental problem many colleges and universities face today is not that of declining enrollments but rather the more problematic one of diminishing financial resources.

The role of non-traditional enrollment has also been unexpected. Although enrollments have increased tremendously in the last two decades, much of the growth has occurred at vocational institutions and community colleges. This is largely due to the availability of federal funds, especially for non-traditional students. Although perhaps not designed as such, federal aid programs tend to benefit non-traditional students who are "independent" and thus need-tested on the basis of their own income and assets, and not in combination with their parents' resources.

The growing fear that federal grant money may be cut, the trend of rapidly increasing tuitions, and the worsening state budget shortfalls that endanger adequate

public financing for education, form the context of the present educational environment. Access to higher education, particularly for non-traditional students, must be reassessed in light of these changes. Moreover, with many students realizing that five years may become the norm for a college education, and as more opt to work at least part-time, if not full-time while attending college, the distinction between traditional and non-traditional may be more blurred than ever. To what extent our higher education system currently meets the needs of non-traditional students is a question of considerable importance, and one that also requires us to examine these students at greater length.

Defining the Non-Traditional Student

Who are these non-traditional students? What common characteristics do they share? A number of researchers have begun to address these questions and have worked to clarify a useful traditional/non-traditional dichotomy. Hughes (1983) describes the differences between the two groups:

> The non-traditional student has multiple commitments, is not campus focused, and prefers informal learning to formal education. The traditional student is primarily responsible for him or herself, is campus focused and more inclined toward structured, formal learning (p. 53).

White (1981) offers a slightly different perspective and defines the non-traditional student as a person who is:

1. responsible for him or herself, and frequently directly responsible for the well-being of others;

2. perceived by others as generally fulfilling several roles typical of mature adults in our society (e.g., worker, taxpayer, voter, concerned community citizen, spouse, parent); and,

3. one who perceives formal educational activity as only one of several competing or conflicting priorities, and often as an incidental activity, though one of increasing importance (p. 2).

Bean and Metzner (1985), in studying the attrition rates of non-traditional students, have defined this population in more specific terms:

> A non-traditional student is older than twenty-four, or does not live in a campus residence (e.g., is a commuter), or is a part-time student, or some combination of these three factors; is not greatly influenced by the social environment of the institution; and is chiefly concerned with the institution's academic offerings (especially courses, certification, and degrees) (p. 489).

In their view, the two groups can be differentiated on the basis of age, residence, and full- or part-time attendance, as well as ethnicity, gender and socioeconomic status. In addition, non-traditional students are distinguished by the "lessened intensity and duration of their interaction with the primary agents of socialization (faculty and peers) at the institution they attend." As a result, non-traditional students are taking courses for utilitarian purposes more than social venues and thus will be concerned primarily with an institution's academic offerings rather than its social environment (pp. 488-489).

Others, however, note that traditional and non-traditional students cannot be easily classified into simple dichotomous categories. Instead of an "either-or" scenario, these researchers paint a more complex picture. Hauptman (1991) specifies a number of different non-traditional groups, including: students 22 years or older, students enrolled less than half time, students without a high school diploma or its equivalent, students in short-term vocational programs, welfare recipients, prisoners, and individuals in the work force who wish to return for additional training, particularly dislocated workers, farmers, and displaced homemakers (p. 9).

Gold (1992) similarly concludes that the term "non-traditional college student" can mean many different things: part-time students, whether youth or adult; educationally deprived students, whether youth or adult; and/or those engaging in noncollegiate education, specifically, education below the two-year degree level, in colleges as well as in proprietary schools (pp. 33-34).

Likewise, McGivney (1991) writes that "adult learners belong to a wide range of age and occupational groups. They include adults in employment and those out of work; women 'returners' and people facing career transitions; people with special needs and people preparing for retirement" (p. 1).

The scope of these definitions highlights the underlying diversity of these non-traditional students. As Hughes (1983) admits, "even defining the non-traditional student has been a source of ever-increasing ambiguity" (p. 51). Non-traditional students are not a single population nor can they be effectively generalized and classified by simple dichotomous categories. Any definition that limits non-traditional students to those meeting a narrow set of criteria inevitably will fall short of encompassing this diverse population.

To study non-traditional students, however, we need an adequate means of describing them. As revealed by the multitude of definitions, there is no "one" non-traditional population. Rather, there are many subgroups that share different unifying characteristics. Some, for example, lack a high school diploma; some prefer night school at a four-year institution; others prefer a two-year public or proprietary institution; still others need to work full-time and can only attend school part-time.

Instead of focusing on the entire non-traditional population, many researchers, either implicitly or explicitly, have opted to focus on a few particular subgroups. This abstraction is necessary to create a more "workable" definition. Descriptive statistics have more value when applied to a group that is not completely heterogeneous. Moreover, statistical inferences about the non-traditional student's motivation to pursue further education are more likely to be theoretically justifiable and statistically significant in these cases. A clear example is the difficulty in assuming that the motivating factors for a prison inmate that dropped out of high school are the same as those inspiring a 25-year-old high school graduate to return to college.

For our purposes, therefore, we do make a few simplifying assumptions. First, we avoid engaging in a study of the entire non-traditional population and instead choose to focus on a particular sub-group. For the purposes of this study, we define as non-traditional those students who first attended a four-year institution at least part-time at age 23 or older.

Importance of the research

Lacking in much of the current literature is an in-depth look at the factors that affect non-traditional student enrollment. While some studies have touched upon different factors, suggesting that distance to a local community college, tuition levels, and the selectivity of admissions policies have an effect, few have been comprehensive in their scope. Those that have, in particular O'Keefe (1976) and Bishop and Van Dyk (1975), offer us a limited perspective of the present when we consider how the context of American higher education has changed so profoundly in the years that have elapsed.

Other studies have provided us with tangentially relevant information. Cox (1990), who sought to determine why older adults (over sixty) leave the university, notes that "the motivations of older students reflect the diversity of their interests and life-styles" (p. 2). Another conceptualization of the motivations for the older student's participation in higher education is that it meets either expressive or instrumental goals (Havighurst, 1976). Implicit in this analysis is that the over sixty learner, as a non-traditional subgroup, is significantly different from the other subgroups and thus warrants closer attention.

Rountree and Lambert (1992), whose research focuses on women in higher education, identify learning for self-satisfaction and learning for job related reasons as the most important motivations for women attending community colleges.

The Sewall study (1982, 1984) analyzed the idea of a "triggering event" as a prime motivation for the adult entry into college. Such a concept of a major life event as a motivator for entering higher education was premised in an earlier work by Aslanian and Brickell (1980), but Sewall reported no single event which acted as a catalyst for college entry. "For most adults, the desire to attend college had been present for a long time, but was delayed because of one or more transitory or situational barriers" (p. 196).

Kasworm, in reviewing available literature to determine influences for adult entry/reentry into higher education, determined that:

> studies reported no distinctive motive patterns for adult undergraduates. Given a lack of common patterns of motives in adult undergraduates, these studies often suggested that researchers should attempt to identify key motivational forces for each setting and each adult student grouping (p. 353).

Building on the groundwork laid out by others, we hope to examine the non-traditional student in greater depth by extending much of the earlier analysis to take into account some of the developments of the last two decades. Such include the increasing role of federal and state governments in funding higher education not only at public but at private institutions as well, and the declining value of a high school education in ensuring good earnings, especially in an American economy that depends more and more on higher-skilled labor. The extent that changing demographics helps to explain the rising enrollments of non-traditional students will also be addressed.

Of course, the fundamental question remains the same: *What factors, characteristics, or circumstances motivate the non-traditional student to enroll? And what influences the quality of the school chosen?* To answer these questions, we assess the impact that socio-economic background, race, gender, marital status, number of children, work experience, and various other factors have on the non-traditional student's decision to attend college. Statistical analysis will be used to help describe

who these non-traditional students are and to assess how accessible higher education really is to them.

In examining this question, however, we do make a few simplifying assumptions. First, we avoid engaging in a study of the entire non-traditional population and instead choose to focus on a particular sub-group. For the purposes of this study, we define as non-traditional those students who first attended a four-year institution at least part-time and at age 23 or older.

To undertake this analysis, we have adapted the NLS-72 dataset, which provides sufficient length (fourteen years after high school graduation) and breadth (sizable national sample) for us to study the characteristics of this sub-group of non-traditional students. In particular, we contrast their socio-economic backgrounds, race, and aptitude with that of the three other groups of students: those who entered a four-year college or university directly after high school, those who deferred, and those who have not yet attended any institution of higher education.

With such an approach, this study hopes to frame certain questions and pose certain analyses which will address the increasingly important impact of the non-traditional student in institutions of higher education.

Chapter 2

Literature Review

In reviewing the past, albeit scant, literature on the subject of the non-traditional student's post-secondary decisions, three studies emerge as most relevant to our own. We summarize them here to help put our own work in perspective. Michael O'Keefe, writing in 1975, attempts to stimulate discussion on future policies related to adult education by discussing what motivates the adult to participate in further education. John Bishop and Jane Van Dyk, also 1975, seek to define some of the determinants of adult college attendance. K. Patricia Cross, in her book *Adults as Learners* (1981), compiles a comprehensive review of literature focusing on the adult as student. Behrman, Kletzer, McPherson, and Schapiro, in a 1992 study parallel to out own, determine what influences post-secondary education decisions for the *traditional* student. The first two studies, while relevant, are quite outdated, and the third paper is pertinent only in its analogous structure to our own.

In addition to these three studies, the review of the National Center for Education Statistics' Digest of Education Statistics 1992 enabled us to verify the explosion secondary enrollment by the non-traditional student. The statistics gathered in Figure 1.1 display interesting trends with regard to non-traditional enrollment.

In what may be deemed the most relevant and directly correlated study to ours, "The Adult, Education, and Public Policy" was prepared by the University of Illinois' Michael O'Keefe in 1975 for the Program in Education for a Changing Society of the Aspen Institute for Humanistic Studies in Aspen, Colorado. O'Keefe, using data collected from 1957 through 1975, reviews some of the programs and policy proposals for adults in education, attempts to delineate the future dimensions

of adult education, and desires to stimulate discussion and debate about the actions to be taken at the state and federal levels with regard to the adult and education.

O'Keefe attributes expanded interest in the United States in the educational needs of the non-traditional student to a variety of factors: our progressively aging society; the changing role of women, including an increased divorce rate; and diminishing demands by the traditional student. He cites statistics which show that the rate at which adults participated in education increased significantly from 1957 to 1972 with a further 2.4% increase estimated annually between 1972 and 1975 (see Table 2.1).

TABLE 2.1 *Adults in Education*

Year	Post-secondary Enrollments		Adult Education	
	Total (All Groups)	% 18-24 Only	Participants (thousands)	% of Adult Population
1957	3,047	20.2	8,270	7.8
1969	7,484	31.5	13,041	10.9
1972	8,265	31.9	15,734	12.4
1975	8,665*	31.4	18,000*	13.3*

Source: NCES, The Condition of Education, 1976.
**Estimates*

While the data in Table 2.1 are for those who participated in adult education on a part-time basis, O'Keefe notes that adults have also increased their participation as full-time non-traditional students. Between 1965 and 1972, the percentage of all enrollments in higher education of those in the age category 25 to 34 increased from 19.1% to 24.3%. In 1974, when data was first collected on enrollments of those 35 years and older in higher education, some 33.3% were identified as over 25 years of age (p. 3).

O'Keefe determines that the strongest factors which correlate with participation in adult education are three: age, previous education, and income. "The young, those who are already well-educated, and those with higher income levels will be found participating at much higher rates than others" (p. 9).

The younger the age group, the higher the likelihood of participation. For adults between the ages of 17 and 34, the level of participation was about 20%, while participation rate for 55 to 64 year-olds was one-fourth of that and for adults over 65, the participation rate was one-tenth of that of the youngest group.

Adults who have had more education participate much more readily in adult education. Those without high school diplomas participate at a substantially lower rate than those with college degrees or more. Adults with higher incomes also tended to participate at a much higher rate than those with lower incomes.

O'Keefe looked at other characteristics of participants and non-participants, including race, sex, employment status, and occupation. Females participated at a slightly lower rate than males. African-Americans had a uniformly lower participation rate than whites. Employed adults participated most frequently in some form of adult education while those who identified themselves as housekeepers and those seeking work (the unemployed) participated at a lower rate.

Participating by occupation group finds less skilled workers participating at a substantially lower rate than professional or technical workers. Within the latter group, almost half (47.6%) of the employed teachers participated in some form of adult education. O'Keefe notes here that this significantly higher rate among teachers is a strong suggestion of the sensitivity of participation in continuing education to the requirements set for further education as a prerequisite for job and salary advancement (p. 14).

The majority of adults participating in continuing education are taking occupational courses, including vocational, technical, managerial and professional

studies. Nearly one quarter of the participants were registered for general education courses.

O'Keefe's study, like our own, asks *why* do adults participate in further education. He concludes that occupational courses form a large proportion of the adult education activities. The majority of participants indicated that the principal reason for being involved in further education was job-related, either for job improvement or advancement. The next most frequent response for participating in adult education was "personal or family interest," which was further defined as a desire for "general information" (p. 17).

In analyzing the data, O'Keefe pinpoints distinct sub-groups whose relative participation is significantly below the average: individuals who have less than a high school diploma, the unemployed, female heads of household, the elderly, and middle-age career changers. He advises more careful examination of the reasons for lower participation, other characteristics of the groups, and the extent to which an increase of participation would represent a social good (p. 20). In his conclusion, O'Keefe notes that if public support is provided in general form without deliberate targeting on specific needs, it will benefit the younger, the already well-educated and those with higher incomes. It may well be in the public interest to provide support or incentives to stimulate increased participation by the aforementioned sub-groups whose lower participation rates have been established.

In an attempt to estimate future participation trends, O'Keefe formulates "extrapolations." He predicts that between 1976 and 1980 adult participation is likely to increase at a slower rate of growth than the preceding 5-10 years because of a slower rate of growth of the eligible adult population. Adult participation, after 1980, he predicts, will decrease due to demographic reasons and the perceived lessening value of further education (38-39).

Whereas O'Keefe predicts decreased adult participation, the NCES provides data to highlight the ever-increasing numbers of older students enrolling in undergraduate programs. "The Condition of Education" study clearly shows that the number of students aged 25 and over in undergraduate programs at four-year and two-year colleges has steadily gained from 1976 and 1990. Specific age group subset participation has increased at different rates, with the greatest change occurring in the thirty-five and over set, where the percentage attending college increased from 7.9 to 12.8 in the course of 14 years.

Given these demographic data, it is clear that O'Keefe's "extrapolations" had seriously underestimated the growth of non-traditional student enrollment. The need to bring a better understanding of this recent phenomenon makes our present study all the more pertinent and timely.

Another relevant study for our purposes is the one conducted in 1975 by John Bishop and Jane Van Dyk through the Institute for Research on Poverty and the University of Wisconsin-Madison. Bishop and Van Dyk, in "Can Adults Be Hooked on College? Some Determinants of Adult College Attendance," look at non-traditional participation at the college level nearly two decades ago, using data collected from the 1970 Census. Their study examines institutional and individual determinants of adult participation in higher education.

They note that the rising number of adults in higher education can be attributed to a number of factors: the increased number of conveniently located colleges offering courses tailored to meet the special needs of adults; the need to learn new skills as old ones become obsolescent due to technical progress; and the increasing desire of men and women to obtain training that will make possible professional advancement (p. 1).

Their study focused on institutional determinants under public control such as tuition, location, the GI Bill, and admissions policies (selectivity) of public two-

year and four-year colleges as well as individual determinants including age, sex, number of children, income and occupation. Their findings indicated that the absence of a two-year college was associated with a substantial reduction in adult college attendance, and that the individual's age and the presence of children in the family had a strong impact on college participation. Minority status did not have a consistent effect on attendance, but GI subsidies did seem to have a substantial effect, for the attendance rate of Vietnam veterans was considerably higher than that of non-veterans of similar age.

While public efforts to enhance attendance of adults in higher education such as establishing colleges in localities previously with none, keeping tuition low, liberalizing admissions policies, and the GI Bill were successful during the 1960's, Bishop and Van Dyk predict that the future growth of adult participation must inevitably taper. Their reasoning is based on demographics, higher tuition charges, decreased demand for employees with college training, and fewer eligible students for the GI Bill.

They note, however, that if the enrollment of the past was due more to changes in adult tastes for education, the trend might continue into subsequent decades. In addition, a further source of future growth in enrollment, they predict, is the upward trend in the number of adults who have started but not completed college. An adult with one year of college is seven times more likely to be enrolled in a degree-credit program than an adult with just a high school diploma (p. 20).

Cross (1981) provides a synthesis of existing research and theory on the concept of adult learning, looking especially for the implications of such to provide for the improvement of practice. Lifelong learning (previously referred to as non-traditional study) is her primary focus, as she attempts to answer such questions as: *who* participates in adult learning? *Why* do they participate or, alternatively, *why not*? And, *what* and *how* do they learn or want to learn?

In the studies reviewed by Cross, most participants provided practical, goal-oriented reasons for learning. Need for new job skills or for knowledge pertaining to the family catalyzed learning activity. Cross also contends that learning to improve one's position in life is sufficient motivation for many adults, be it a better job or enhanced quality of life.

Cross' Chain-of-Response (COR) model assumes that participation in learning is not the result of one act, but rather a consequence of a chain of responses, each based on an evaluation of the position of the individual in his or her environment. Participation is impacted by self-evaluation, attitudes about education, life transitions, the importance of goals, and the expectations that participation will meet goals, opportunities, barriers, and access to appropriate information.

After reviewing the materials on deterrents to adult participation in continued learning, Cross identifies three obstacles: situational, institutional, and dispositional. Situational obstacles are those related to the learner's own unique situation at a given time: lack of time, money, or child care, for example. Institutional barriers include all that discourages working adults from participating over which they have no control: inconvenient schedules or locations, high fees or tuitions, imperfect course offerings. Dispositional obstacles are those related to attitudes about oneself as learner. Age may affect the learner, with the elderly sometimes feeling that they are too old to learn. The poorly educated frequently lack interest or confidence to continue to pursue a course of study.

Finally, Cross holds that motivation for adult learning will never fit into neat formulas and will be constantly changing. As adults undergo varying stages of their lives, their motives for continued learning will change. She discourages institutions or government agencies from seeking quick, superficial solutions to the problems that arise with a growing non-traditional college population. She encourages them,

however, to create adaptive strategies that will not only benefit the institution, but also the student body.

A recent study, important for its parallelism to our own, was completed in 1992 by Behrman, Kletzer, McPherson and Schapiro: "The College Investment Decision: Direct and Indirect Effects of Family Background on Choice of Post secondary Enrollment and Quality." Their paper, based on data supplied by the National Longitudinal Study of the High School Class of 1972 with its subsequent follow-up surveys in 1973, 1974, 1976, 1979, and 1986, focuses on two components of post secondary schooling decisions for the *traditional* student. Their first concern is to investigate the implications of the endogeneity of high school scholastic achievement as related to the decision to attend college or not. Secondly, they attempt to incorporate an "explicit analysis of choice of institutional quality into the investigation of post secondary enrollment behavior."

Behrman et. al. note that students differ not only in *whether* they choose to attend college but also *where* they choose to do so. Such dimensions of choice are captured in their study in two steps: by distinguishing the choice of enrollment at a two-year or four-year institution, and by measuring the quality of a four-year college by comparing the instructional expenditures per student (p. 2).

Different variables were tested to determine their influence in the decision making process of whether or not to attend college or university. Parental schooling, family income, the number of siblings and birth order were tested as part of family characteristics and background. Individual characteristics such as race and gender were analyzed as well. Test score, high school achievement, labor market conditions, and prices of post secondary education were also tested to determine their influence on college attendance. These same variables were tested again to see their influence on the quality of institution attended.

Models of various effects led to some interesting conclusions. For instance, "were it not for differences in family background and other conditioning variables, Hispanics and blacks would be substantially more likely than whites to attend four-year colleges" (p. 16). Or "if white students had the mean characteristics of nonwhite students (including, among other things, less parental education, lower family income, larger family size and higher unemployment) their enrollment probabilities would be lower than those of blacks and Hispanics with those same characteristics at both two-year and four-year colleges" (p. 17).

Behrman et. al. conclude that explaining post secondary attainment and institutional choice is a complex problem. They find evidence that high school achievement levels (as measured by test scores) depend on many of the same background variables that influence college attendance patterns. Unable to reject the hypothesis that high school achievement is endogenous in their model of post secondary behavior, their evidence indicates that "failure to account for endogeneity will lead one mistakenly to attribute part of the effect of high school achievement to family background variables that influence achievement levels" (p. 21).

With regard to the quality of the post secondary institution chosen, the study concludes that the education level and income of parents proved significant in explaining choice of quality, as did high school achievement levels (again treated as endogenous) and some variable measuring the price and availability of public higher education (p. 22).

Lastly, the NCES report, as previously discussed, generally supports the widely suspected increase in enrollment in higher education for non-traditional students. Figure 2.1 represents a breakdown by age group--both male and female. While 14 to 21 year-olds have a slight increase in enrollment over time, as do 22 to 34 year-olds, over an approximate 40-year span, students who are 35 years old and older show a

pattern of increase that rises sharply over the next decade, and supports the claim that this growth will continue into the next millennium.

Examining the data further, by breaking out the male and female components, total male enrollment (Figure 2.2) supports the conclusion of the trend recounted above for non-traditional students, while 14 to 21 year-olds and 22 to 34 year-olds actually show a leveling off. Female enrollment (Figure 2.3a) overall, on the other hand, shows growing enrollment over time without exception. Further breaking out the female part-time and full-time students, the data for full-time female students (Figure 2.3b) shows a slight, but steady rise in enrollments, while part-time female students (Figure 2.3c) shows that 14 to 21 year-olds maintain a steady increase. Non-traditional students show a dramatic explosion in their numbers, especially looking at the current and projected figures.

By breaking down the female enrollment into full- and part-time status, the statistics show that the sharpest increases by far have been in the part-time cohort (Figure 2.3c). While all three age groups display rising numbers of female part-time students, the most critical increase is found in the oldest group of women: those 35 and above. This number is projected to quadruple between 1970 and 1997, while other cohorts have rather leveled out.

Both the present and projected trends of increased numbers of women in higher learning have strong implications for today's institutions of higher education. Whereas in the past, such colleges and universities may have been considered male bastions, it appears very likely that the successful institutions of the future will prioritize female enrollment needs and will assess their abilities to meet those needs critically.

Total Enrollment by Age

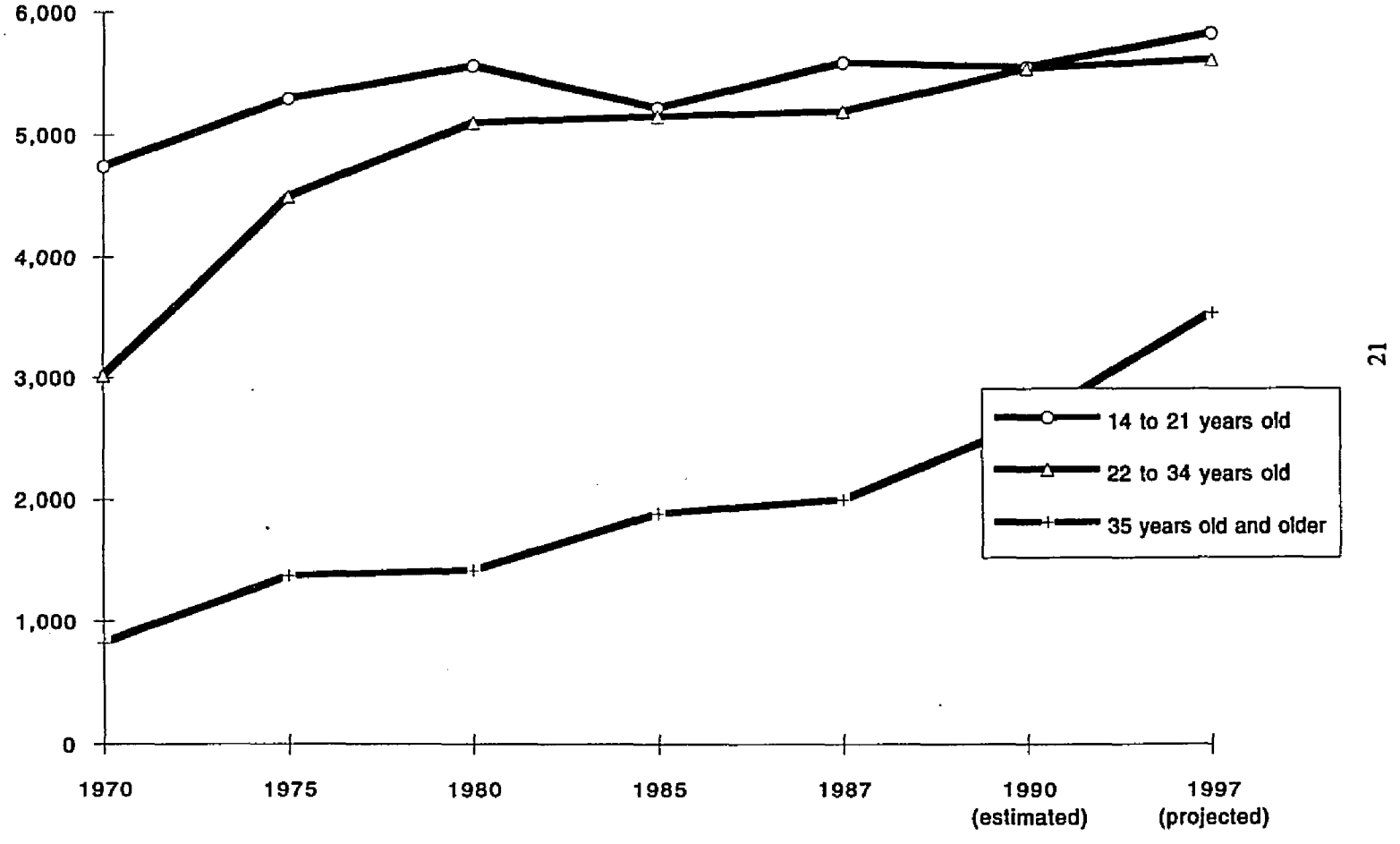

Figure 2.1

Source: *Digest of Education Statistics 1992*

Male Enrollment by Age

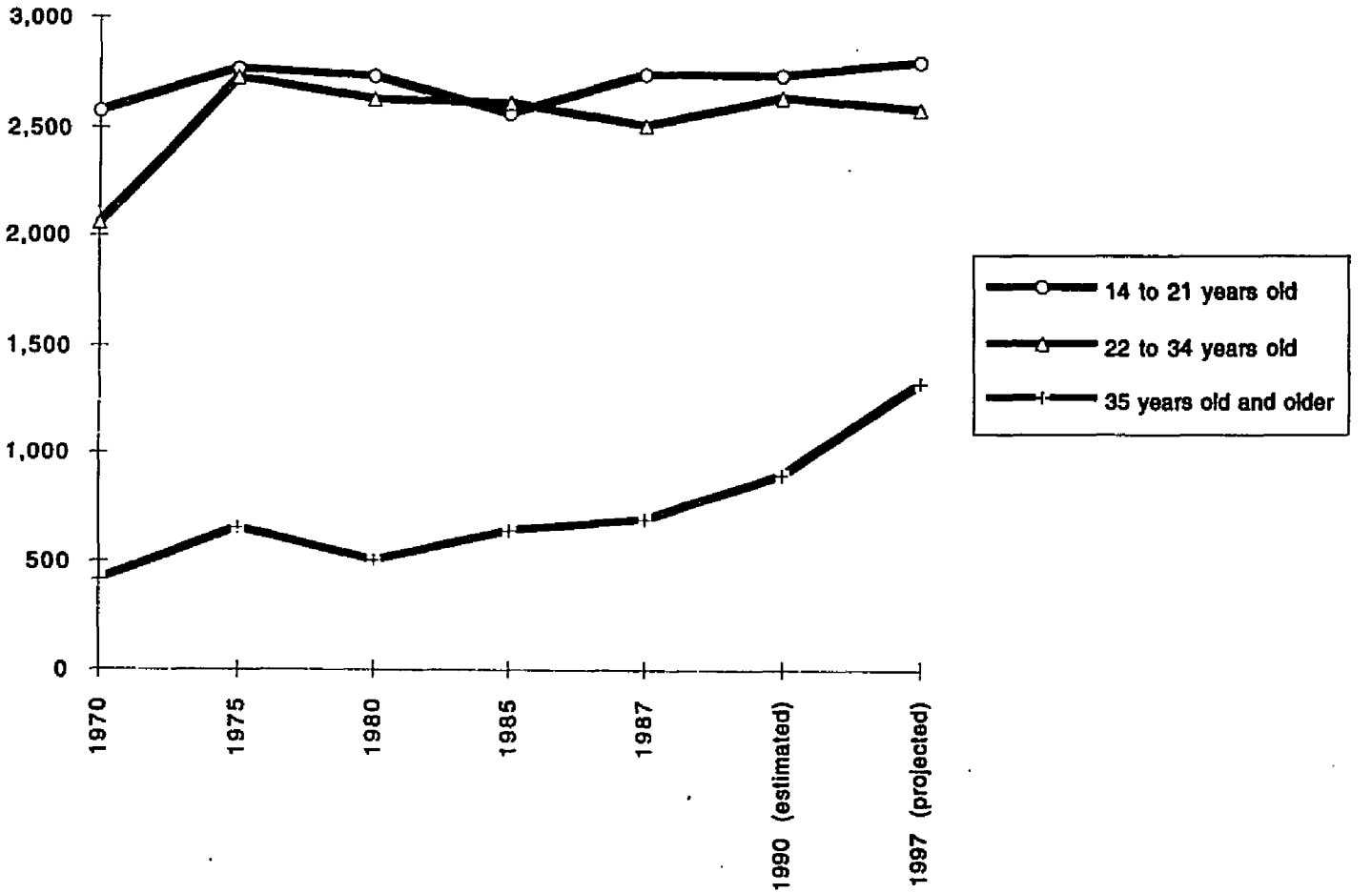

Figure 2.2

Source: *Digest of Education Statistics 1992*

Female Enrollment by Age

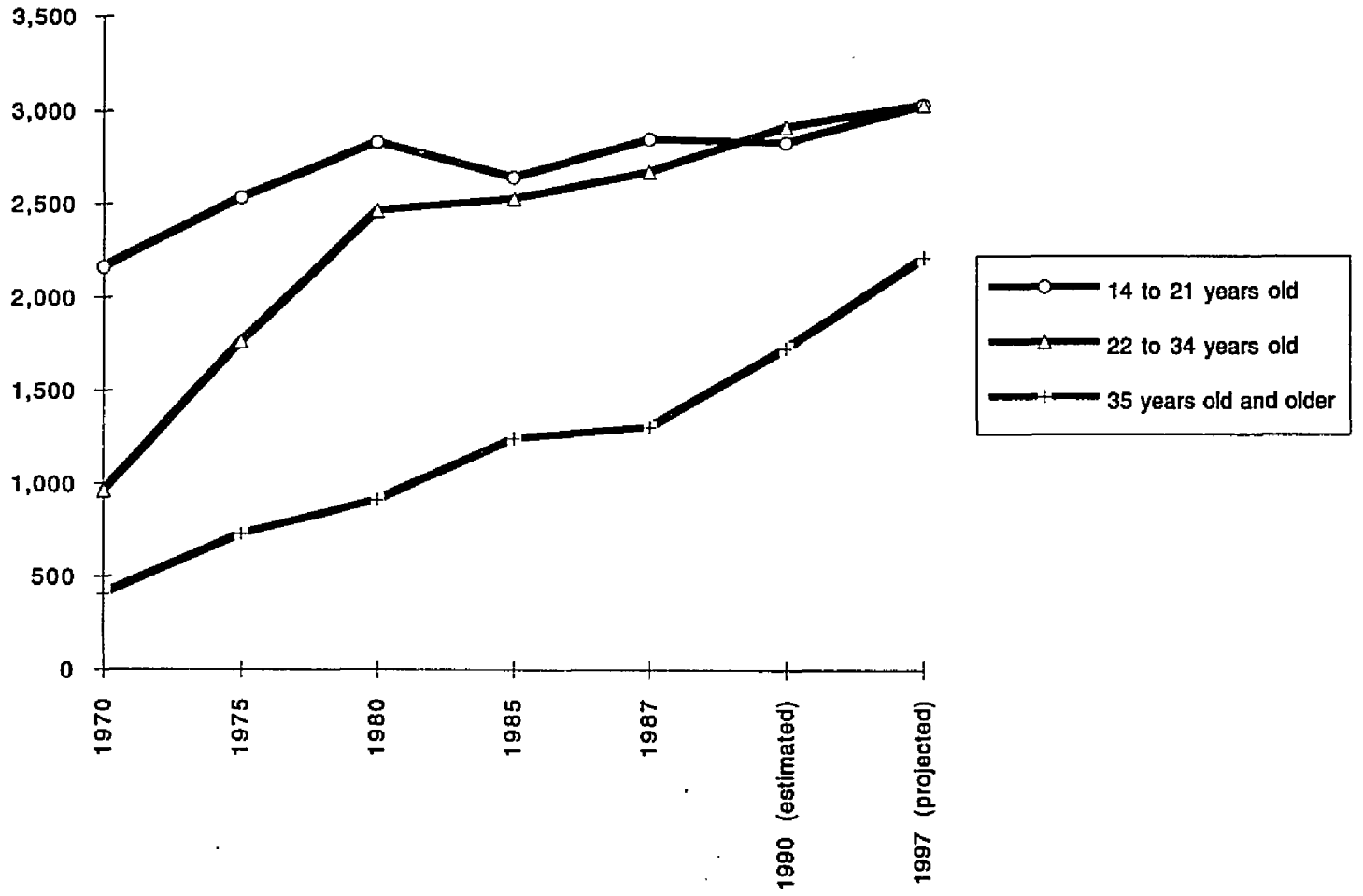

Figure 2.3A

Source: *Digest of Education Statistics 1992*

Female Full-time Enrollment by Age

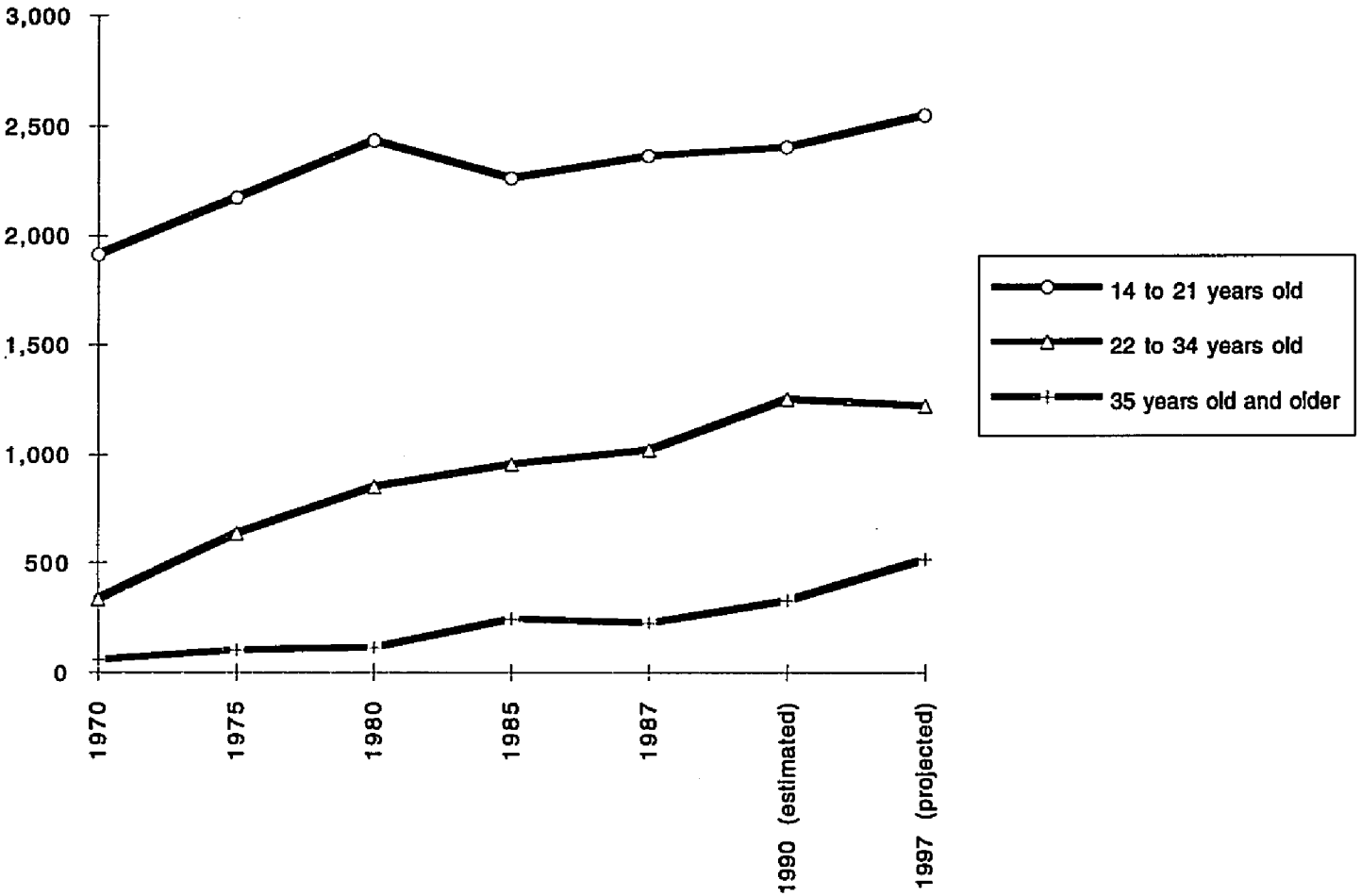

Figure 2.3B

Source: *Digest of Education Statistics 1992*

Female Part-time Enrollment by Age

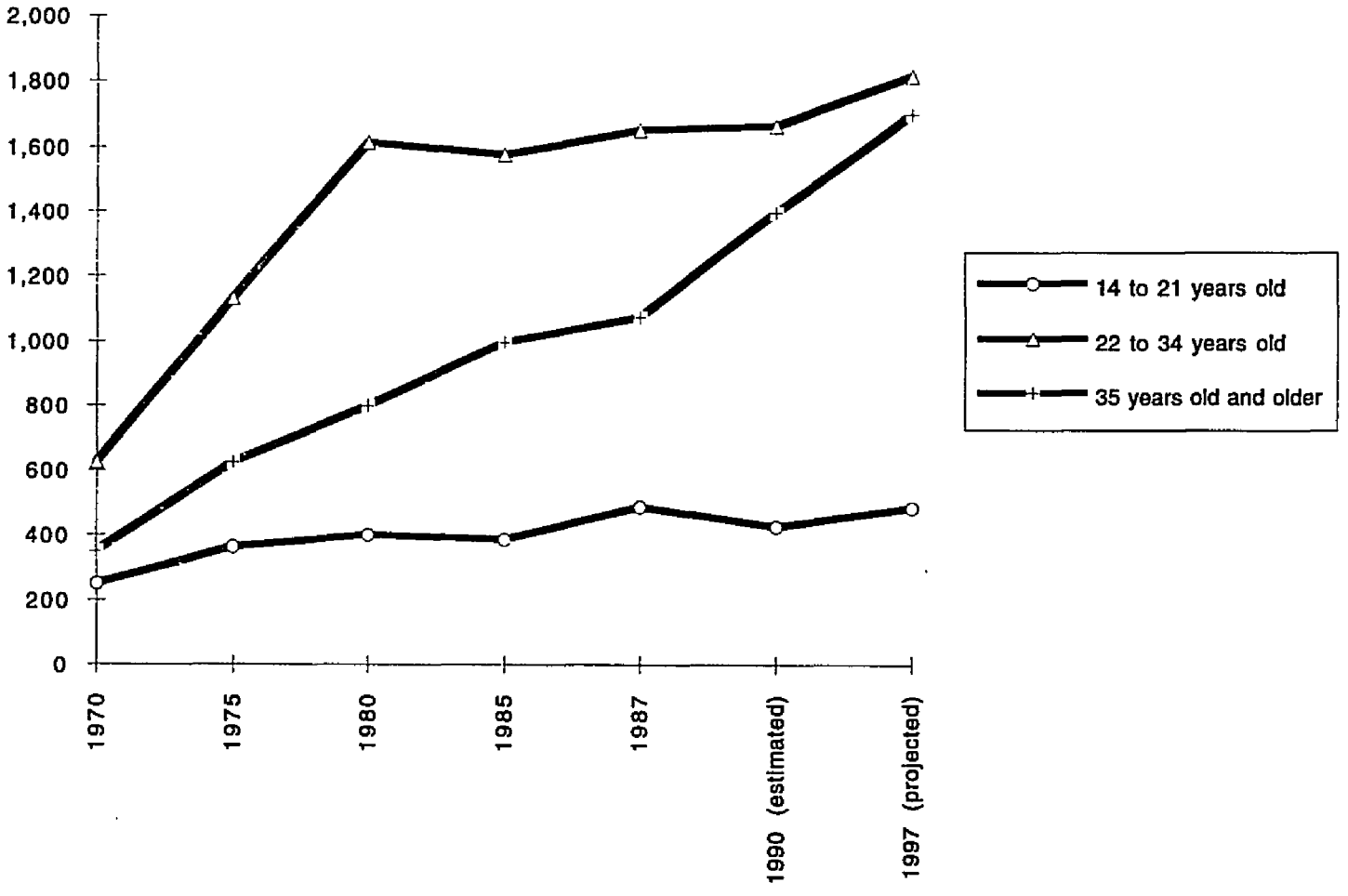

Figure 2.3C

Source: *Digest of Education Statistics 1992*

Chapter 3

Methodology and Model

The choice to go to college five or more years after high school graduation is often more difficult and may be based on different motivations and circumstances than those facing the "traditional" student. With this in mind, we sought to uncover the possible reasons and factors that may influence one to postpone initial entry to a later date. Specifically, we hoped to find out how these effects differed between traditional and non-traditional students. We begin by explaining the sort of questions asked to determine these factors, and the variables employed. The source of the data is then discussed, as are the statistical procedures used.

Research Questions

In reviewing materials that focused on non-traditional students, it became increasingly apparent that there were few sources available, and even those were already outdated. In an attempt to examine the reasons leading to non-traditional enrollment, we focused on the following factors which we thought were relevant:

i. gender
ii. race
iii. ability (high school performance, standardized tests)
iv. family background
vi. life experience
vii. personal attitude

Some of these had been previously touched upon in other studies. Demographic characteristics such as race and gender were thought to play a significant role and had been incorporated as personal characteristics in Bishop and Van Dyk (1975) and Berhman, et. al. (1993). In Roundtree and Lambert (1992), gender was used as a filter to specify the subgroup to be examined. The relation that

family background and ability have on enrollment was incorporated in Berhman, et. al as well, although the particular focus was on traditional students and the issue of endogeneity. Differing life experiences and motivations were also mentioned in the literature on student enrollment, although few had attempted to apply these to the contemporary phenomenon of the non-traditional student.

The Intuitive Argument for the Variables

We hypothesize that the non-traditional student's decision to attend college is influenced by several factors that, in broad general terms, include family background characteristics, the student's demographic profile and aptitude, and personal experience. This framework of analysis is based loosely on that used by Behrman, et al. (1992), which tested some of these variables in regard to the post-secondary schooling of the traditional student.

Many of the variables we used are based on those presented by Leslie and Brinkman (1988) who analyze the economic return of a college education in their book *The Economic Value of Higher Education*. Their variables include: ability; parents' education, income, and occupation; marital status; family size; health; religion; and region of the country (p. 43).

Their findings are also interesting in that though they do not differentiate between traditional and non-traditional students, they conclude that in higher education students do respond to prices. Enrollments vary with prices charged; hence, they contend, subsidies that reduce net prices should effectively increase enrollment levels for targeted students.

They note, also, that student response to price seems to decline with family wealth and institutional prices and selectivity; therefore, response is greatest among low-income students in public community colleges and is least among the wealthier students who enroll in private colleges. Student aid does increase access, does promote choice, and does enhance persistence in college. The implications here for both the traditional and non-traditional student are important, especially in these difficult economic times.

The influence of family background is incorporated in the model through variables that describe the environment in which the student had grown up. Parental educational attainment, in particular, serves as a proxy for the attitudes toward education that may have shaped the student's perceptions towards higher education. Other factors such as parental income, the father's Duncan socio-economic index, the number of siblings and the birth order, describe the family's capacity to invest in higher education.

The student's gender and race are also included to factor in the impact that varying demographic profiles may have on educational attainment. Student aptitude is measured by the results of a standardized test administered during the senior year of high school.

The Variables

We considered the following variables in addressing the questions relevant to this research.

Personal Characteristics

Gender:
- male
- female

Race:
- white
- black
- Hispanic
- Asian
- other minority (American-Indian, other)*

* Other minority was not significant in any of the models.

Ability

[1] total of four base-year aptitude and achievement exams administered by NCES
[2] high school rank** *(not included in final models)*
[3] semesters math***
[4] semesters science*** *(not included in final models)*

Family Background†

[1] first-born status *(whether first-born, not included in final models)*
[2] birth order *(not included in final models)*
[3] number of siblings *(not included in final models)*
[4] father's SEI *(Duncan Socio-Economic Index, not included in final models)*

Life Experience

[1] military experience *(whether the student was involved in the military after high school and before college, and if he or she eventually attended)*
[2] homemaker experience†† *(whether the student was a full-time homemaker after high school and before college, and if he or she eventually attended)*

Attitudes

[1] plan to attend college *(whether, in the spring of the senior year in high school, the student had planned to attend college or attain a college level education after high school; not included in final models)*
[2] likes to attend college *(whether, in the spring of the senior year in high school, the student would like to attend college or attain a college level education after high school)*

** High school rank was not significant in any of the models.
*** Semesters science and semesters math were very similar.
*** Semesters science and semesters math were very similar.
† These variables were found not to be significant in most cases.
†† Homemaker experience was not used because of the low sample size that resulted.

A Description of the NLS-72 Dataset

Origin of the NLS-72

Consistent with its mandate to "collect and disseminate statistics and other data related to education in the United States" and to "conduct and publish reports on specific analyses of the meaning and significance of such statistics," the Center for Education Statistics initiated the National Educational Longitudinal Studies (NELS) program. As a long-term project to "study longitudinally the educational, vocational, and personal development of high school students and the personal, familial, social, institutional, and cultural factors that may affect that development,"[1] the NELS program obtained and compiled data that would allow both the comparison of cohorts over several years (time-series or inter-cohort/inter-generational analysis) and the study of successive cohorts (fixed-time analysis).

Currently, the NELS program consists of three major studies that are continually updated: The National Longitudinal Study of the High School Class of 1972 (NLS-72), High School and Beyond (HS&B), and the National Educational Longitudinal Study of 1988 (NELS: 88).

History of the NLS-72

Following a preliminary study in 1968 to determine the specific data needs of policy makers and researchers, plans were drawn for a national study. After several years of planning, the survey was launched in 1972 and comprised of "a deeply stratified national probability sample of 1,200 schools with 18 seniors per school,

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1 (NLS-72, 1987, p. 2)

school size permitting."[2] NLS-72 was the first major study of its kind and began with a base year survey in the spring of 1972 that included a sample of approximately 19,000 high school seniors. Out of these, 16,683 completed the survey for an 87.7% response rate. Information was obtained from a Test Battery, a School Record Information Form, and a Student Questionnaire.

An additional 4,500 students who did not participate in the earlier study were added to the study the following spring in the first NLS-72 follow-up. These were included to correct for the school non-response rate in the base year. Of the 22,654 students surveyed, 21,350 (94.2%) responded. The retention rate among the 16,683 students of the original base year study was 93.7%. Information was obtained about the students' location in October 1973 and about their work, education, and training experiences and plans.

Subsequent follow-up surveys took place in the fall and winter of 1974, 1976, and 1979. Retention rates for these were 94.6%, 93.9%, and 90.8% respectively. Overall retention from the base-year study, which comprised of individuals who had responded to all of the surveys, was 78% or about 13,980 out of the original 16,683 who responded from the base year and about 57.3% out of the total 22,652 who had participated in at least one survey in the NLS study.

The most recent survey occurred in the spring and summer of 1986 when these adults were about 32 years of age and had been out of high school for 14 years. A sub-sample of 14,489 members of the original 22,652 were surveyed, with 12,481 (about 89%) responding.

Although its name is derived from the initial survey year and may imply the contrary, NLS-72 should not be viewed as a census of the high school class of 1972. Unlike a census that determines the characteristics of a *changing* population at regular time intervals, NLS-72 focuses on the characteristics of a *fixed* population, or cohort,

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2 (NLS-72, 1987, p. 4)

at different points in time. As such, NLS-72 is a longitudinal study, which in this case has kept track of the aptitude, growing educational and work experience, and the changing socio-economic background, motivations, expectations, and plans of the class of 1972 over the span of fourteen years and five follow-up surveys.

The nature of our research into motivations and factors affecting non-traditional enrollment lends itself nicely to using longitudinal studies. So far, no other data set offers the breadth and coverage that NLS-72 does. With the last follow-up conducted in 1986, the total coverage of 14 years is sufficient for our purposes. Although a similar longitudinal study, High School & Beyond (HS&B), was launched in 1980 and scheduled a fourth follow-up in 1990, data for the most recent survey will not be available from CES until 1993 at the earliest. As the earlier HS&B follow-up in 1986 allows a coverage of only six years after high school, NLS-72 remains, for our purposes at least, the most appropriate and up-to-date study available. A more detailed description of the NLS-72 dataset is included in Appendix A.

Statistical Procedures

We are interested in both descriptive and predictive approaches to the data--i.e., we wish to present a profile of the non-traditional student by various demographic variables, and we further wish to derive a model for predicting enrollment decisions by non-traditional students. For the descriptive statistics, we have relied on some simple condensations of previously published data (*Digest of Education Statistics, 1992*), as well as on some cross-tabulations of the NLS-72 dataset (using simple procedures within SAS). For the predictive approach to the data, probit procedures (within LimDep) were employed. A description of the rationale underlying a probit model is now appropriate.

The Probit Model

To engage in statistical analysis, we first present a model of non-traditional student enrollment. The variables we include are those specified above, which we hope will be [1] statistically significant and [2] will have a noticeable impact on the enrollment decision of whether, where (what quality), and when to attend a four-year college or university. The methodology we have used is a probit analysis that involves simple attendance (any college or university education, whether completed or not) or non-attendance on the left-hand side of the equation.

The probit model is an example of what is known in statistical analysis as a "discrete choice model." In order to better understand what this means, it is best to start by looking at what a probit model is not. The primary objective in statistical analysis is to establish a quantitative relationship among variables. The most basic method for accomplishing this is a technique known as the Classical Linear Regression Model (CLRM). Using this model or technique, we attempt to estimate the effect that a change in one or more variables, the independent variables, has on another variable, the dependent variable. In many cases, the CLRM is the most appropriate model for continuous variables. The essence of the CLRM is a statistical technique that estimates coefficients B_0 and B_1 in a linear equation as an attempt to find the best fitting straight line among data points.[3]

$$Y_i = B_0 + B_1X_1 + u_i$$

3 (Mirer, 1983, p. 76)

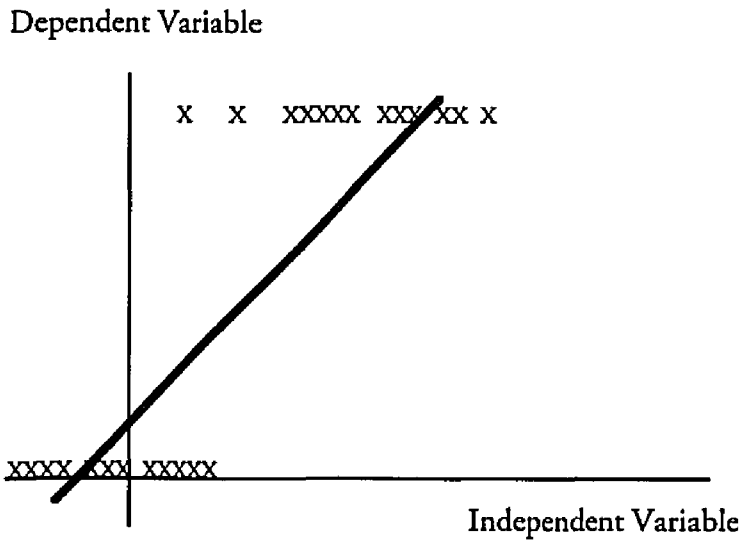


Figure 3.1: The Linear Model

In studying higher education, the dependent variable that we are looking at is classified as a *discrete* variable, as opposed to a *continuous* variable. Discrete variables are those that can only take on a few values. For example, in looking at the decision to attend college or not, the variable that we are interested in can be thought of as having only two possible values. The individual decides to either attend college or not to attend college. There are only two choices, and we can assign a value of 1 to the decision to attend college, and a value of 0 to the decision not to attend college.

$y_i=1$ if student *i* decides to attend college
$y_i=0$ if student *i* decides not to attend college

For analyzing discrete variables the CLRM is not an appropriate model.[4] As was mentioned, the variable of interest can take on only the values of 0 or 1. The CLRM would treat the variable as though it were continuous. Clearly any value other than 0 or 1 has no meaning in the case that we are studying.

For this very reason, statisticians have developed the probit model. The probit model attempts to fit an "S-curve" to the data rather than a straight line. The "S-

[4] (Dhyrmes, 1978, p. 331)

curve" is actually a function based upon a *cumulative normal distribution function* rather than a straight line.[5] Thus the probit model is a statistical technique that allows us to interpret the effects that changes in independent variables such as family income, age, and race will have on the likelihood or probability that an individual will decide to attend college.

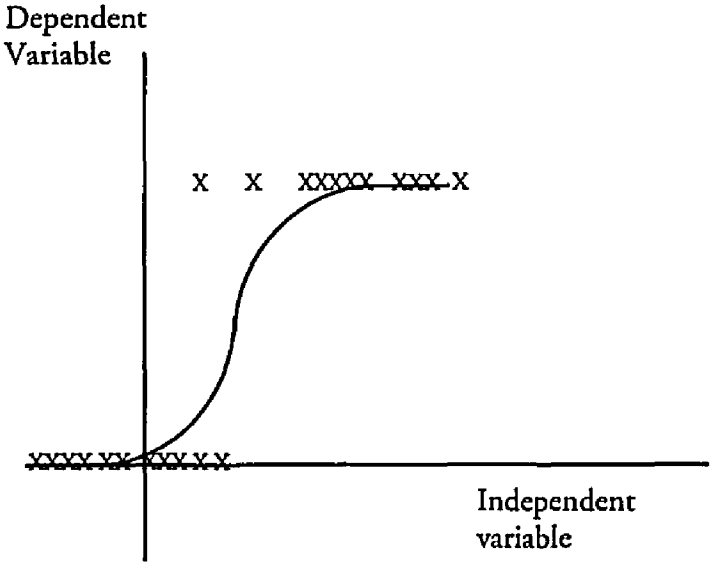


Figure 3.2: The Probit Model

5 (Kmenta, 1986, p. 553)

Chapter 4

Probit Results on Non-Traditional Student Enrollment

What factors determine non-traditional student enrollment? And, to what degree are these factors influential? These two questions are the central focus for this chapter. To analyze the determinants of non-traditional enrollment, we first extracted variables from the NLS study and created a dataset that included only observations for non-traditional and non-enrolled students. Non-traditional students were defined as those who first entered college between 1975 and 1986, while non-enrolled students were those who had not enrolled in college as of 1986, the last year for which we had data. Enrollment in vocational schools or engagement in non-enrollment based academic programs were not used as a means for differentiating students. Variables were grouped into five general categories:

[1] personal characteristics,

[2] academic ability and coursework,

[3] life experience,

[4] student attitudes, and

[5] family background.

In modeling personal characteristics, we chose race and gender as the two most important factors. Race was broken down into five subcategories: white, black, Hispanic, Asian, and other minority. For academic ability, a composite of the NLS base-year achievement test was constructed. Other variables such as ACT scores or SAT composites were unavailable for most non-traditional and non-enrolled students. For high school coursework, we targeted the semesters of math the student had taken. This served as a good proxy for both the rigor of the student's high school curriculum as well as the degree to which it was college-preparatory.

In terms of life experience, we constructed specific activity variables from the ACT171-ACT879 series in the NLS fourth follow-up. These variables were to reflect the experience that students gained in the period immediately after high school and before college (if they enrolled at all). Several different experience variables were created, including service in the military, homemaking duties, and part-time and full-time work in any of the years prior to college enrollment. Other experiences, such as marriage or unemployment, were either impossible to determine for all the students in the sample, as in the case of marriage, or like unemployment, they were applicable to all at one point or another.

Attitudes towards learning were proxied by the highest level of higher education students had liked to attain, as reported in the spring of 1972. Family background variables included mother's education, father's education, and father's Duncan SEI (Social-Economic Indicator) index. Variables determining whether the student was living with the mother or the father (in case of divorced parents) were included as well.

Once the selected variables were constructed, missing and erroneous observations were excluded. Missing observations resulted in cases where students were either not routed through that portion of the survey instrument or had somehow failed to answer the relevant question. Erroneous results were usually observations found to be inconsistent by the data cross-checking in the creation of the NLS dataset, or clearly wrong, as in the case of multiple responses for a one-choice only question.

This "clean" dataset was then used for probit analysis under LIMDEP. Because some variables had fewer than the total number of observations, the degrees of freedom in each model varied according to the variables included. Different models were specified and analyzed with the best results reported in Table 4.1. Some models had to be rejected because of extreme multi-collinearity or an insufficient

number of observations. This was particularly problematic for many of the life experience variables. Moreover, some of the family background variables proved not to be significant, signifying that these were not good indicators for non-traditional enrollment. For all the models, the dependent variable was non-traditional college attendance, where values of 0 and 1 represented non-enrolled and non-traditional status respectively. The probit results are reported in Table 4.1. OLS (ordinary least squares) estimates for the same models are included in Table 4.2.

Four models were specified, with the earlier ones being the most general in scope and the latter ones the most specific. The first model includes race and achievement as variables determining likelihood of entering college after 1975. The race variables were constructed as a series of mutually exclusive dummy variables, and as such, only four are included, with the base case being white. The achievement variable as well as the variables for blacks and Hispanics were significant at the 1% level or better. The variable for Asians was also significant, but at the 5% level. Lastly, the variable for other minority was not significant at all, probably reflecting the fact that it includes an array of different racial groups. This categorization was necessary to allow for a sufficient number of observations.

Interestingly, the effect for being black, Hispanic or Asian is positive. That is, blacks, Hispanics, and Asians are more likely to enroll as non-traditional students than whites. Likewise, a high score on the NLS achievement composite was linked with non-traditional student attendance. As probit analysis can only determine the sign and significance level for the variables, OLS estimates were constructed for each model to determine the actual impact each of variable. As Table 4.2 shows, the effect of being black was a 12.77 percentage point greater likelihood in enrolling as a non-traditional student than that of the base case (i.e., being white), holding all other variables and effects constant. Likewise, the effect for being Hispanic was a 9.65 percentage point increase in the probability of enrolling. For Asians, the rise was

much more dramatic, with the impact being 31.37%. The achievement variable had a relatively low impact (0.39%), but this is relative to each additional point in the composite score (which ranged from 108 to 269).

The next model expanded the scope of analysis by including gender and semesters math. The variable for gender was coded as a dummy that equaled 1 if the student was female and 0 if the student was male. As Table 4.1 shows, most variables were significant, with black, achievement, and military at the 1% level; Hispanic and semesters math at the 5% level; and Asian at the 10% level. Only other minority was not significant at all. The impact of the variables from Model 1 decreased slightly, with the coefficient for black dropping the most from 0.1277 to 0.0891. Being female and having military experience were positively correlated with non-traditional attendance. Women were 7.43% more likely than men to enroll. The impact of military experience was much higher at 43.70%.

Model 3 adds the attitudes variable, which was found to be significant at the 1% level. The only variable noticeably different was Hispanic, which became significant only at the 10% level. Attitudes had a strong positive correlation with non-traditional education and had an impact of 14.37%.

The last model adds family background by including father's education. Other family background variables were tested and found not to be significant. The variables from model 3 remained significant in model 4, with Hispanic becoming significant at the 5% level while semesters math dropped to the 10% level. Father's education was significant at the 1% level and had a slight positive effect at 3.85%.

Overall, these four models show that personal characteristics, ability, life experience, attitude, as well as family background all have a positive effect on non-traditional student enrollment. Specifically, minorities (blacks, Hispanics, and Asians); those with military experience after high school or plans for educational

attainment; or those that came from highly educated families were more likely to enroll as non-traditional students.

Table 4.1

Probit Estimates of the Effect of Various Characteristics
on Probability of Non-traditional Student Enrollment
(t-ratios in parenthesis)

Variable	Model 1	Model 2	Model 3	Model 4
Constant	-3.2715	-3.2904	-3.0266	-3.1887
Race				
Black	0.4427 *(4.513)***	0.3158 *(2.965)***	0.2841 *(2.656)***	0.3615 *(3.322)***
Hispanic	0.3457 *(2.952)***	0.3071 *(2.465)***	0.2456 *(1.940)**	0.3151 *(2.445)***
Asian	0.8839 *(2.157)***	0.7204 *(1.657)**	0.8085 *(1.834)**	0.7830 *(1.779)**
Other Minority	-0.0011 *(-0.008)*	0.0120 *(0.078)*	0.0060 *(0.039)*	0.0353 *(0.227)*
Gender				
Female		0.2703 *(4.147)***	0.2501 *(3.805)***	0.2452 *(3.711)***
Other Characteristics				
Achievement	0.0132 *(12.626)***	0.0114 *(9.885)***	0.0095 *(8.009)***	0.0092 *(7.685)***
Semesters Math		0.0441 *(2.480)***	0.0356 *(1.983)***	0.0316 *(1.748)**
Life Experience				
Military		1.2591 *(10.614)***	1.2235 *(10.192)***	1.2310 *(10.156)***
Attitudes				
Wants to attain college-level education			0.4393 *(6.642)***	0.4093 *(6.141)***
Family Background				
Father's Education				0.1272 *(4.271)***
	n = 2544	n = 2292	n = 2269	n = 2249

*** *Significant at 1% or better.*
** *Significant at 5% or better.*
* *Significant at 10% or better.*

Table 4.2

OLS Estimates of the Effect of Various Characteristics
on Probability of Non-traditional Student Enrollment

Variable	Model 1	Model 2	Model 3	Model 4
Constant	-0.5088	-0.4908	-0.3986	-0.4450
Race				
Black	0.1277	0.0891	0.0777	0.0986
Hispanic	0.0965	0.0846	0.0669	0.0852
Asian	0.3137	0.2502	0.2746	0.2651
Other Minority	0.0077	-0.0089	0.0094	0.0164
Gender				
Female		0.0743	0.0679	0.0658
Other Characteristics				
Achievement	0.0039	0.0033	0.0027	0.0026
Semesters Math		0.0136	0.0107	0.0094
Life Experience				
Military		0.4370	0.4179	0.4171
Attitudes				
Wants to attain college-level education			0.1437	0.1332
Family Background				
Father's Education				0.0385
	n = 2544	n = 2292	n = 2269	n = 2249

Chapter 5

Descriptive Statistics

Introduction

This chapter presents descriptive statistics for non-traditional students, mostly in tabular format. Results for other types of students, namely traditional, deferring, and non-enrolling, are included to allow for comparison and to establish a context from which the results for non-traditional students can be viewed. In doing so, these empirical results serve to address the fundamental question of how non-traditional students differ from other kinds of students.

The first three series of figures focus on the time of college entrance, with Figures 5.1, 5.2, and 5.3 showing the enrollment decisions of traditional, deferring, and non-traditional students respectively. The rest of the results are presented as a series of panels, each of which contains several related tables. Panel 5.1 provides a more detailed picture of student enrollment activity, broken down by student group and institution type. The data in the figures and in Panel 5.1 are unusual in that they span over the entire period of the NLS dataset, namely the years 1972-1986. Like most of the other panels, results are broken down by student type.

In Panel 5.2, we focus on the characteristics of the sample and describe the gender and racial composition of the students in our study. The question of student race is particular interesting and is highlighted by two similar tables, one with breakdown and totals by student type and the other by student race.

Next, the series running from Panel 5.3 to Panel 5.6 focuses on the impact specific factors have on student enrollment. Panels in this series approach the issue of impact indirectly by contrasting the replies different types of students gave to the

same questions. Many of these questions focus on reasons for non-enrollment. Where applicable, the original question (or a shortened paraphrase) from which the table results are based is included at the bottom of the table. The date at which a specific question was asked is also included below the table number.

Panels 5.3 and 5.4 describe how financial constraints affect student enrollment, with Panel 5.3 describing family considerations and Panel 5.4 outlining the student's own financial situation. Panels 5.5 through 5.6 center on student characteristics, with Panel 5.5 highlighting lack of information and personal uncertainty and Panel 5.6 outlining the role of student academic ability. The last panel in this chapter focuses on educational attainment. Panel 5.7 concludes with a chronology of the highest level of education students attained at three different points in time: October 1976 (approximately 4 years out of high school), October 1979 (7 years out), and October 1986 (14 years out).

Some care must be taken in interpreting these results. First, the sample we have used is not a statistical (population-weighted) sample of the entire 1972 high school graduating class and thus, cannot be used to infer for the entire national cohort. Also, most table results are weighted by response; that is, only responses are included in the percentage calculations while non-responses have been dropped. Those for whom the question did not apply or who failed to answer the question are not included in the specific table that depends on that question. Thus, some tables may have totals below 7865, which is the number of observations in our entire sample. These varying rates of response prevented a viable means of incorporating population weights. Lastly, because of the nature of self-reported data, some inconsistencies may exist. However, these are minimal, as extensive checks for consistency have been conducted both in the creation of the data subset for this study and by NCES in the creation of the original NLS dataset.

General Methods and Procedure

All empirical work is based on the NLS-72 dataset, which includes the base year and five follow-up surveys. Only students who appeared in all survey instruments are included in this study, which resulted in subset of 7865 observations. Selected raw variables were then extracted and merged with created variables to form a SAS dataset for analysis. SAS Proc Tabulate was then used to create the tables in this chapter. In most cases, the values for analysis variables were tabulated by student category.

Student Classification

The year of initial college entry was used to create four categories of students. College entry as defined here includes attendance at junior/community colleges, four-year colleges and universities, and graduate or professional institutions. However, it does not include vocational schools nor academic programs that do not require enrollment (i.e. correspondence courses, distance learning, etc.). Those attending in the calendar year 1972 were classified as "traditional" students and represented 4731 observations or about 60% of the sample. Those who entered college in the calendar years 1973 or 1974 were classified as "deferred" students and totaled 533 or about 6.7% of the sample. Non-traditional students were those who entered college in any year between 1975 and 1986. There were 646 non-traditional students, which is approximately 8.2% of the sample. The remaining 1955 observations (24.8% of the sample) were classified as "non-goers."

As no NLS variable exists that records student enrollment activity on a calendar year basis, several series of constructed variables were created. Two of these formed the basis for Panels 5.1 and 5.2. The initial series recorded first-time college

enrollment by type of institution and year while the other series monitored enrollment activity, also by type of institution and year. These were based on all the NLS enrollment and educational activity variables, including the ACT171-ACT878 and CACAD72-CACAD76 series, as well as the variables from the fourth follow-up supplemental survey.

Figures 5.1, 5.2, and 5.3

These three series of figures track the year in which students entered college for the first time. For each "pie-section," the values reported refer to the number of students and the percentage of the total subgroup population. As expected, all traditional students enrolled in 1972, with the majority (72.59%) entering at the 4-year college/university level. This was more than 2-1/2 times the number (27.25%) entering at the 2-year college level and was the only year in which 4-year enrollments outnumbered 2-year enrollments by such a large margin. In all other years, the pattern was reversed. For students who deferred a year, most chose to enroll at the 2-year level, with 35.83% choosing that route compared to the 31.33% who enrolled at the 4-year level and the 26.64% who deferred for yet another year. Similarly, enrollments for those who deferred until 1974 follow the same pattern, the case being 16.32% to 15.76% in favor of the 2-year level.

This trend also applies to non-traditional students, which we have defined as those entering in 1975 or later. In every year except 1986, more non-traditional students enrolled at 2-year colleges than at 4-year institutions. The difference is relatively large in some years, with rates of 11.46% to 8.51% in 1975, 7.43% to 5.11% in 1977, 2.63% to 0.77% in 1981, and 3.25% to 1.24% in 1983. Although 1986 proved to be the exception, the rates of enrollment were relatively close at 0.46% and 0.62% respectively.

All of these figures are expressed as percentages of the entire sub-group, which is 4731 for traditional, 533 for deferring, 646 for non-traditional, and 1955 for non-enrolling students. For both deferring and non-traditional students, the consistent decline in enrollment rates point to another trend: the longer the time period since high school graduation, the fewer the number of students that will enroll in college for the first time. Put in another way, the more one defers, the less likely one is to enroll. In the case of non-traditional students, over 50% had enrolled within the three year period between 1975 and 1977, while approximately 75% had enrolled by 1979.

Surprisingly, a few students in each sub-group managed to enroll directly into graduate or professional school. Although not entirely unlikely, this was limited to a very small minority, with only 0.17% of the traditional students and 0.76% and 1.98% of the deferring and non-traditional students enrolling in this manner.

Figure 5.1 Traditional Student Initial Enrollment: 1972

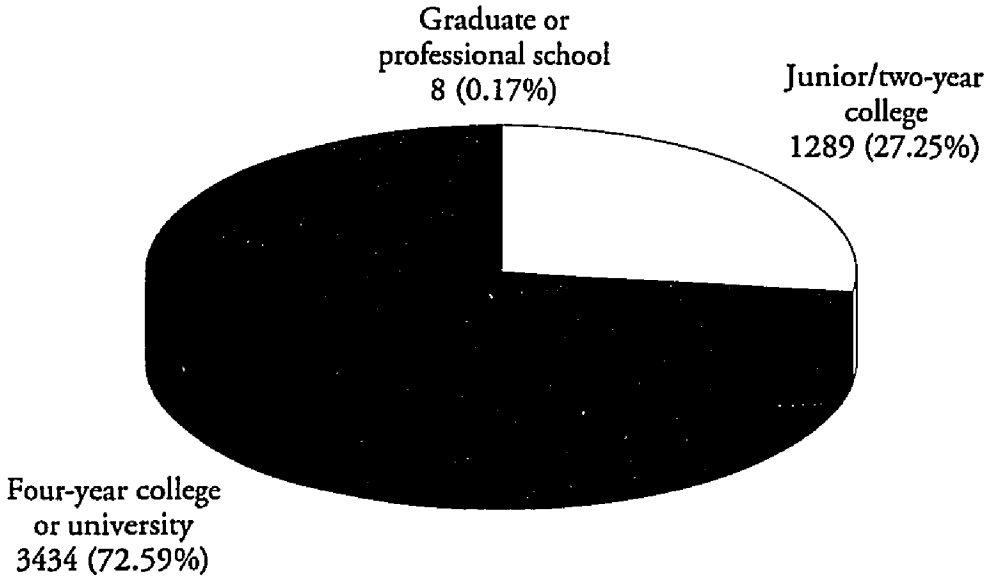


Figure 5.2a Deferring Student Initial Enrollment: 1973

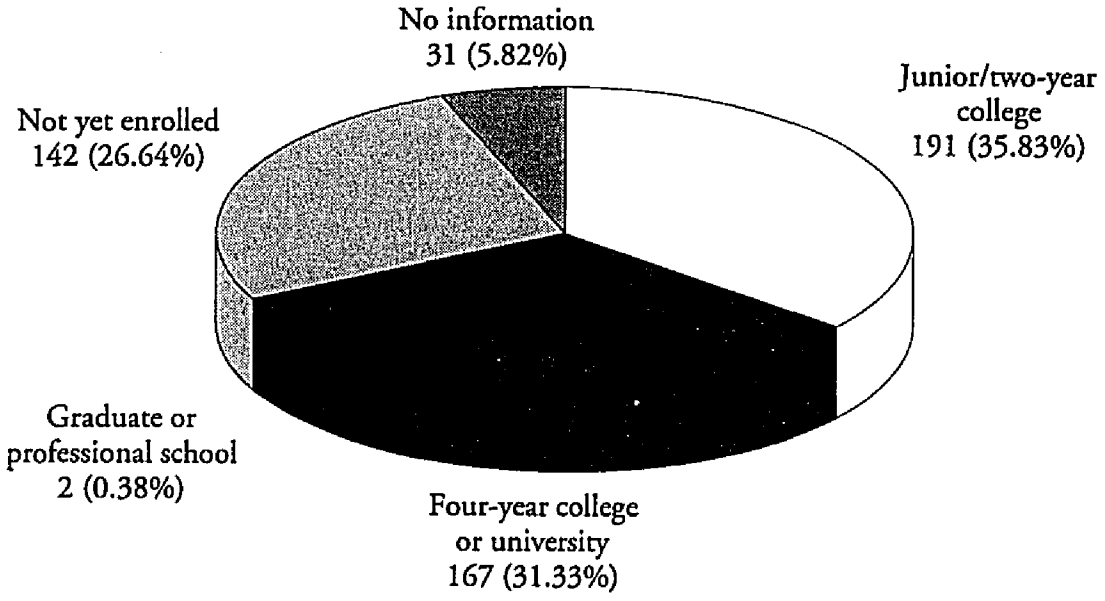


Figure 5.2b Deferring Student Initial Enrollment: 1974

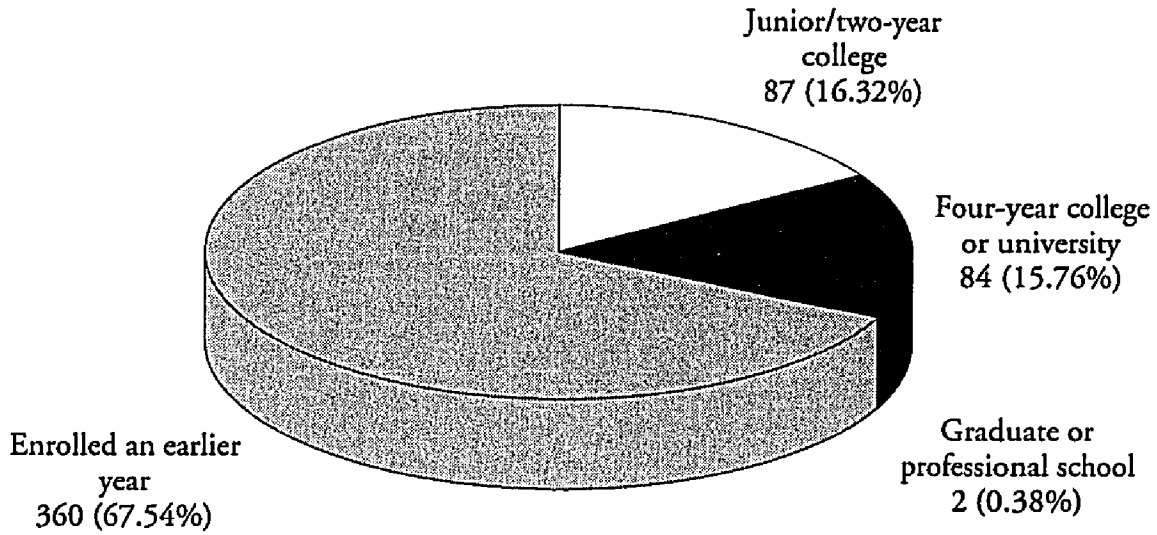


Figure 5.3a Nontraditional Student Initial Enrollment: 1975

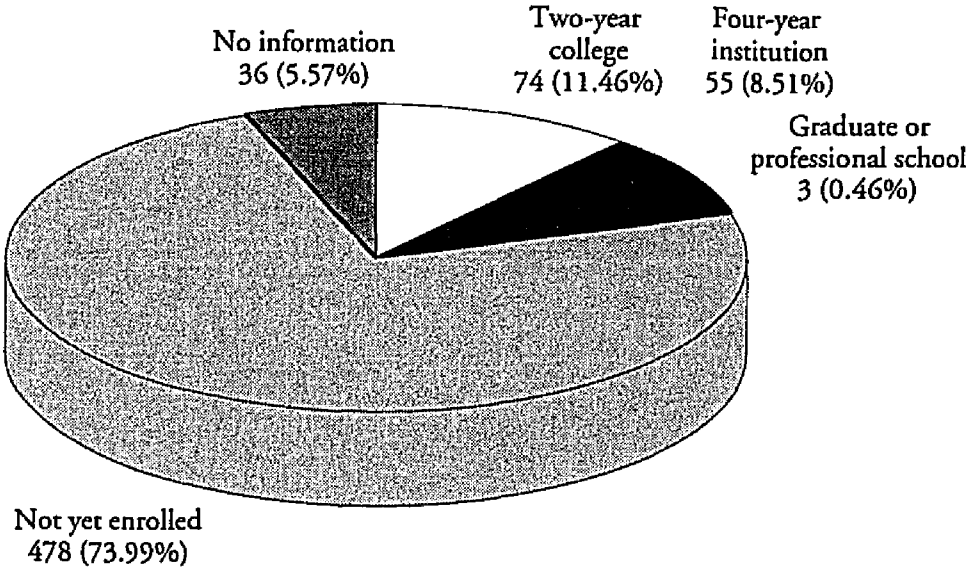


Figure 5.3b Nontraditional Student Initial Enrollment: 1976

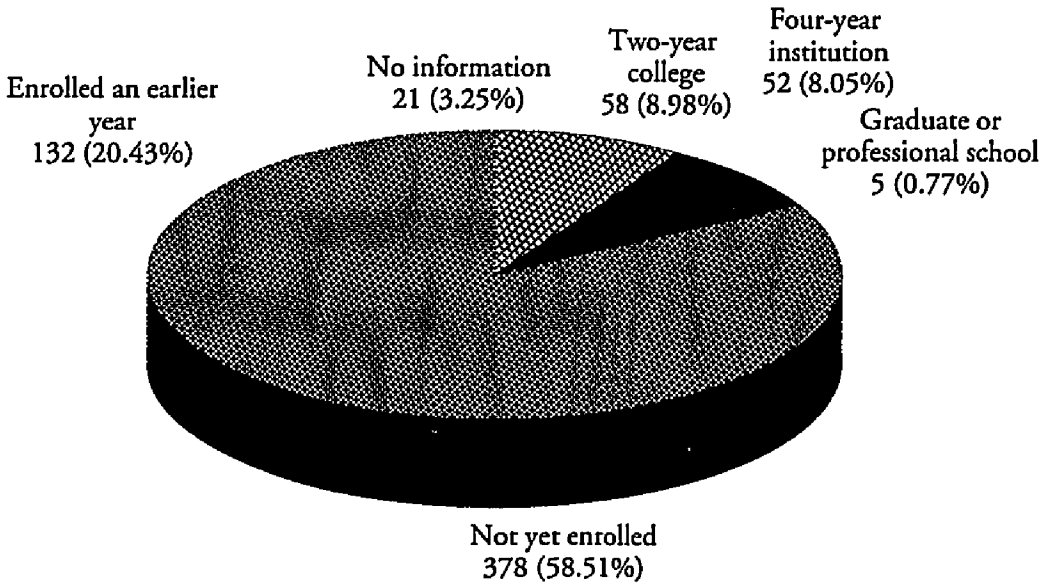


Figure 5.3c Nontraditional Student Initial Enrollment: 1977

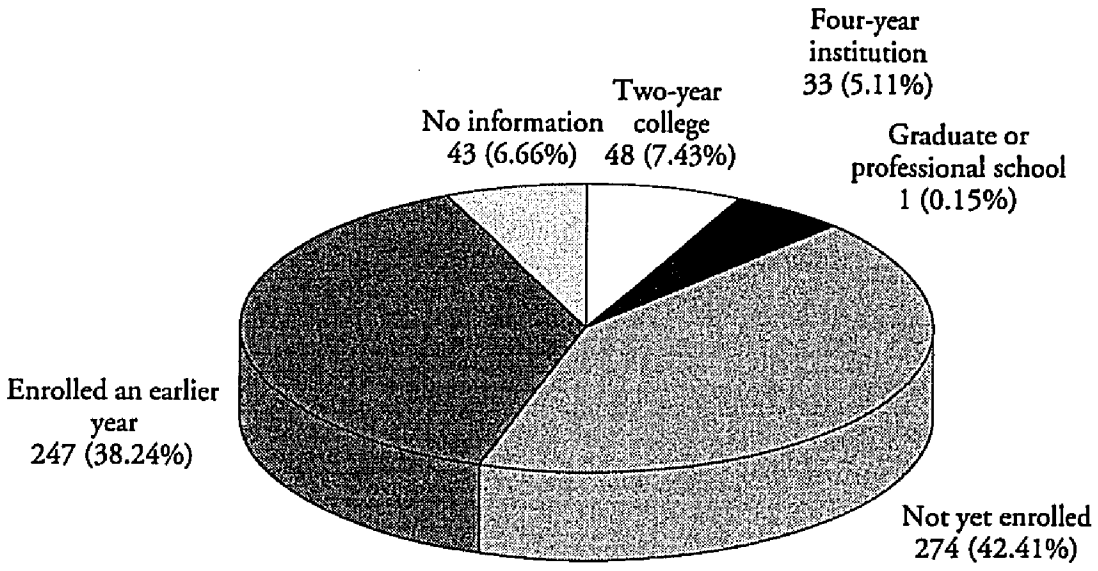


Figure 5.3d Nontraditional Student Initial Enrollment: 1978

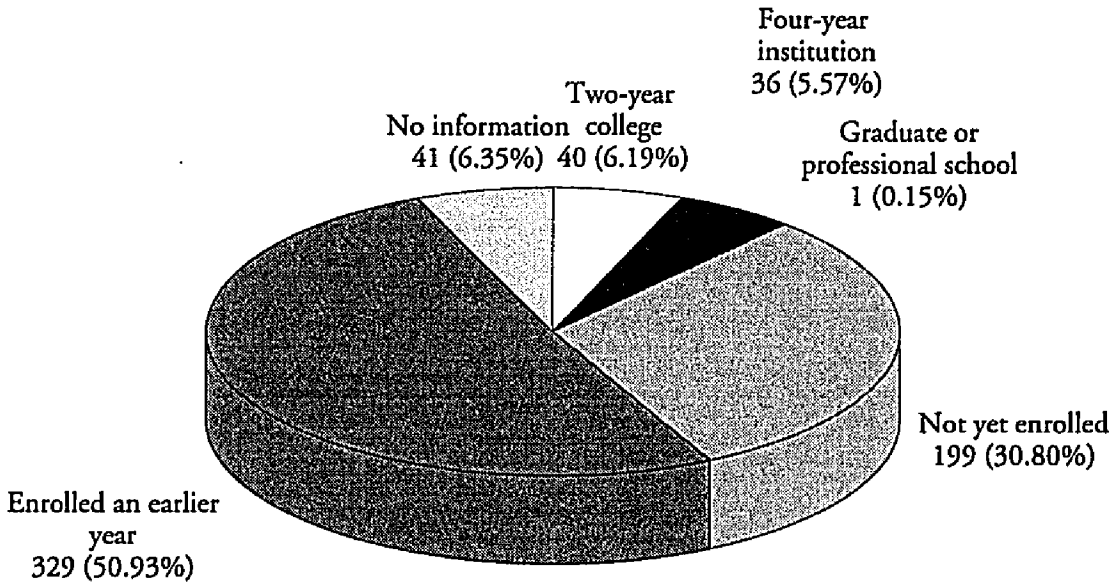


Figure 5.3e Nontraditional Student Initial Enrollment: 1979

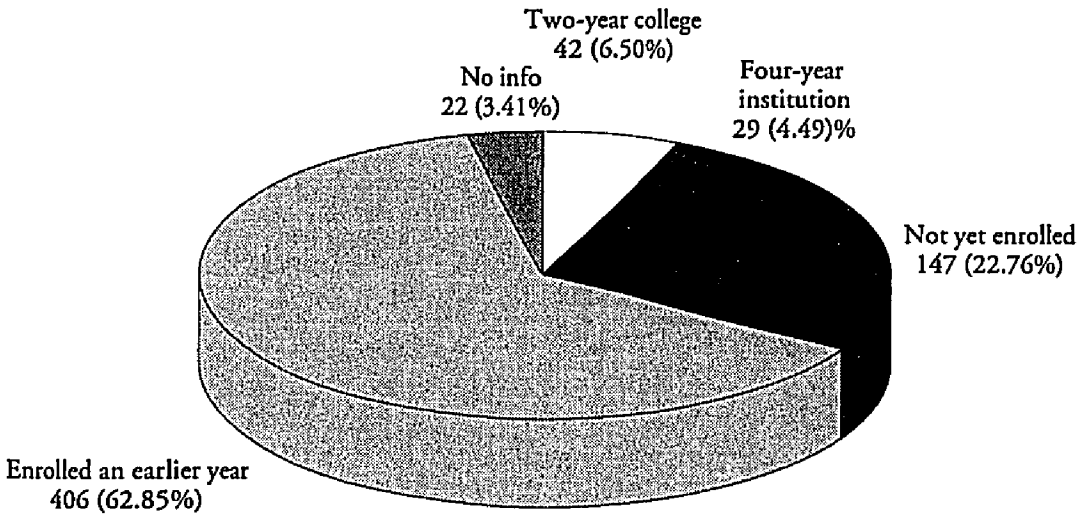


Figure 5.3f Nontraditional Student Initial Enrollment: 1980

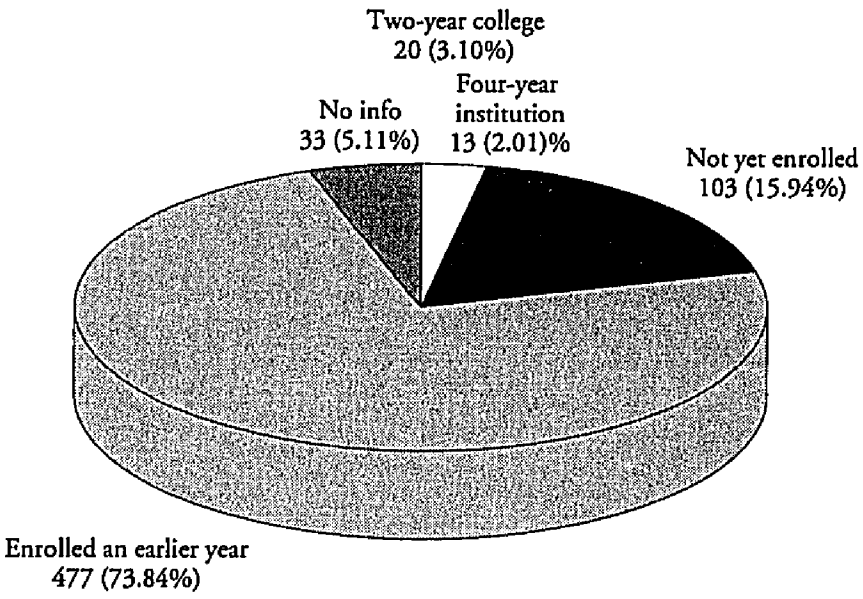


Figure 5.3g Nontraditional Student Initial Enrollment: 1981

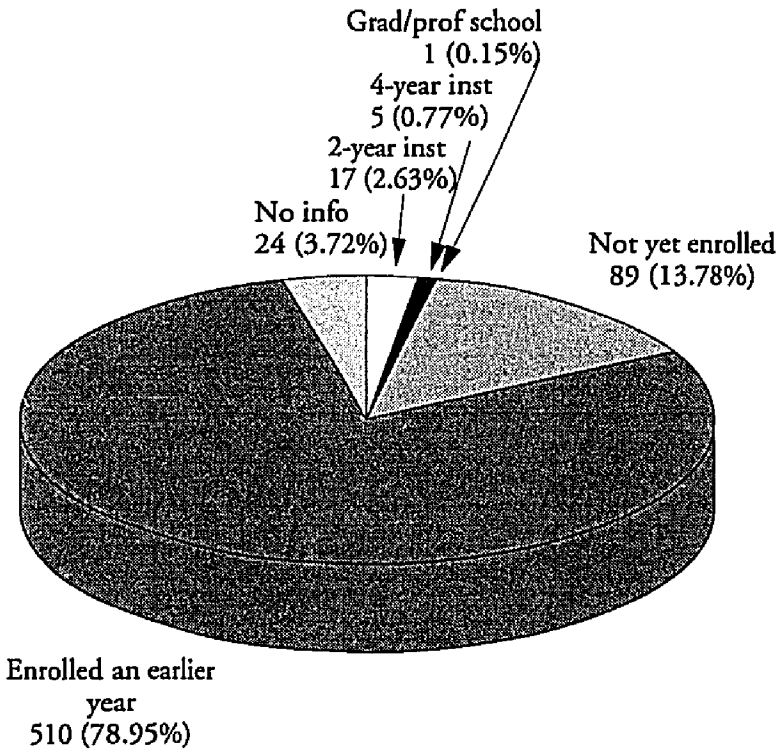


Figure 5.3h Nontraditional Student Initial Enrollment: 1982

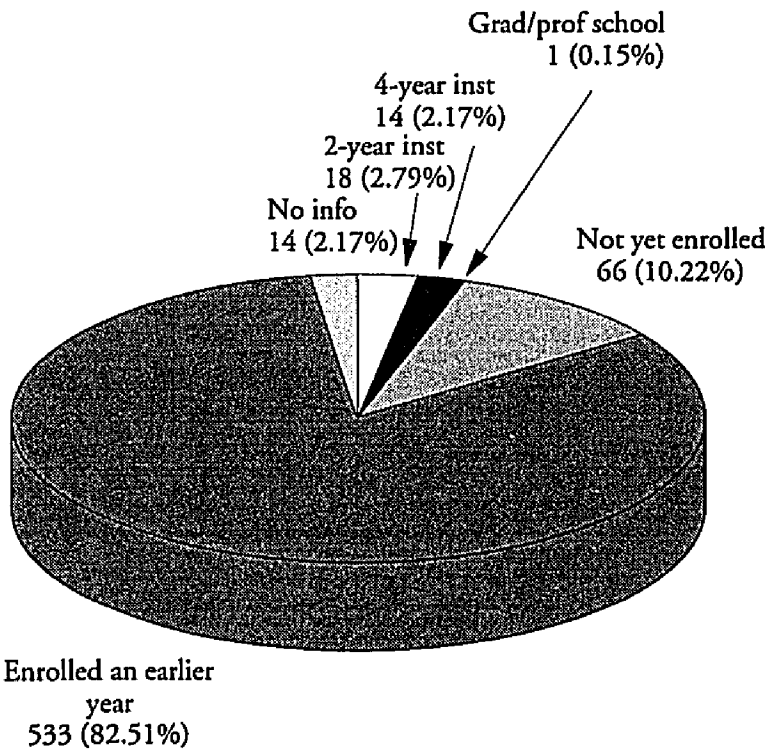


Figure 5.3i Nontraditional Student Initial Enrollment: 1983

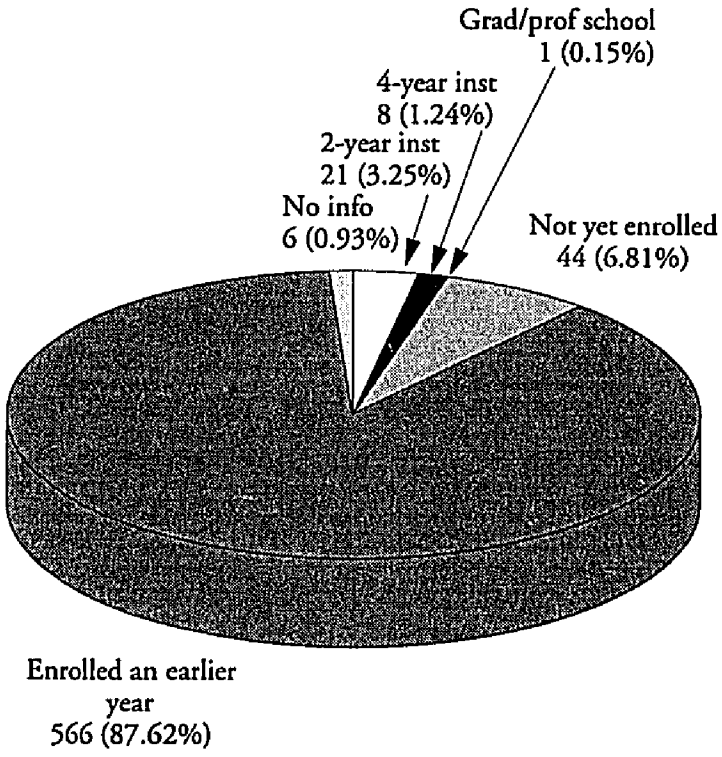


Figure 5.3j Nontraditional Student Initial Enrollment: 1984

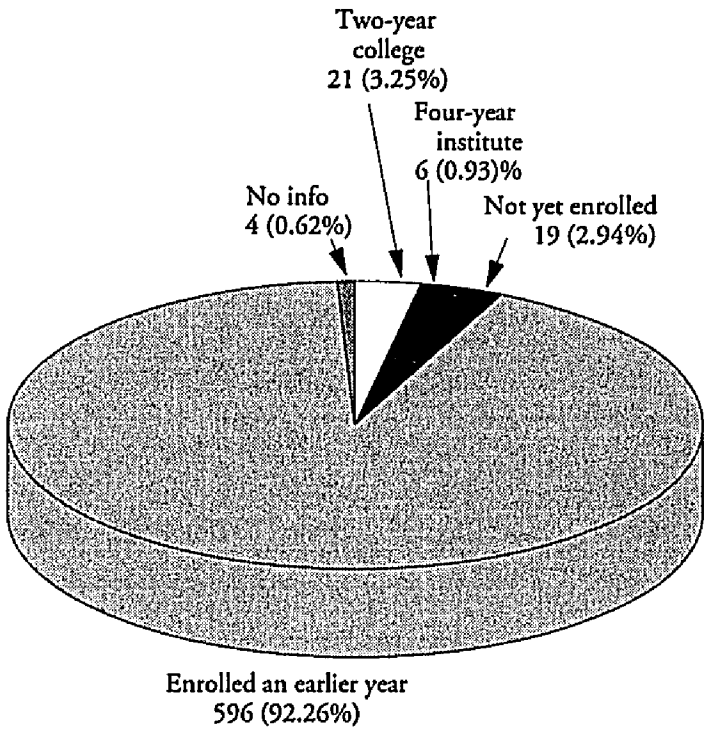


Figure 5.3k Nontraditional Student Initial Enrollment: 1985

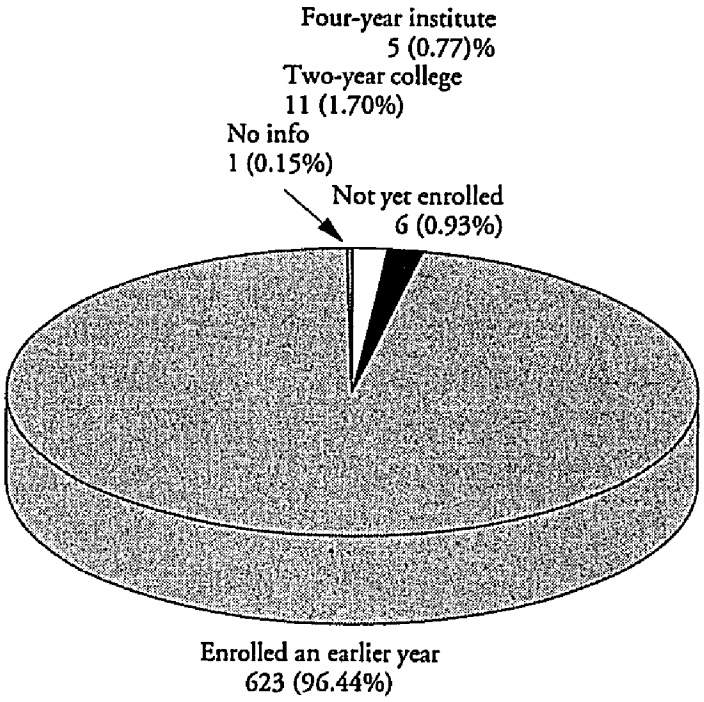
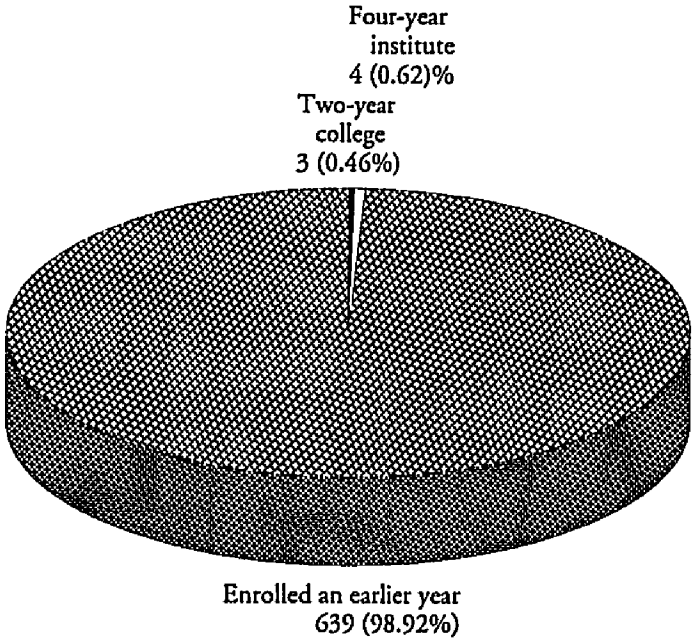


Figure 5.3l Nontraditional Student Initial Enrollment: 1986



Panel 5.1

Student enrollment activity for the years 1972 through 1986 is tracked in Panel 5.1. Because of the difficult nature of creating such a detailed enrollment history from a data source that was not initially designed for this purpose, the category "no information available" has been included. For the most part, the earlier years were better covered in the NLS dataset, with data for each year available from several different surveys, allowing for a fair degree of cross-checking. Results for the years 1972 through 1976 are the most complete and have few missing observations. Findings for 1977 through 1985 have missing observations, but usually within 4% to 7% of the total population. Most of these cases result from non-enrolled students leaving the relevant enrollment questions blank, since they probably thought that they were not applicable. This, however, was not proper way to skip a question and generated an error code for these observations in the NLS dataset. It can be assumed that the majority of those for whom we have no information are probably not enrolled for the given year. A critical exception is 1986, which had a particularly large number of observations coded as "erroneous." Fortunately, the number of students coded as "not enrolled" was abnormally low. Assuming that the number of non-enrolled approximated the number of the previous year, the "real" number of student for whom we have no information becomes 532 or 11.24% of the traditional student population. As this is a slightly higher percentage, care should be taken in interpreting the 1986 results.

Focusing first on traditional students, it is interesting to note that not all of those who started college remained there. Of the 4731 students who entered college, only 4134 continued in the next year, with 597 (12.6%) not reporting enrollment activity at an academic institution at any time in 1973. The majority of those leaving remained out of school and only 17.8% pursued further education at other types of

institutions. Most who re-enrolled opted for vocational schools. While those who were not enrolled increased in 1974 to 745 (15.75%), a large part of the increase was probably due to completion of junior college programs begun in the fall of 1972. A substantial portion of those finishing associate degrees probably transferred to four-year colleges and universities, explaining the sudden rise in four-year college and university enrollments from 3104 (65.61%) in the previous year to 3291 (69.56%) in 1974.

From 1975 to 1979, junior college enrollments remained fairly stable at about 4.4% to 5.5% of the traditional student subgroup, while four-year college enrollments dropped substantially in each year. Of the 3096 (65.44%) enrolled in 1975, only 1820 (38.47%) remained in the following year, with an additional 238, 432, and 157 students leaving in 1977, 1978, and 1979 respectively. Most students probably left by graduating and not by withdrawing. Looking ahead at Panel 5.7, we find that the 1774 students completing college by the fall of 1976 closely parallels the 1709 students that were enrolled in 1974 and had left by 1977.[6] Surprisingly, a sizable minority of traditional students were enrolled in college after 1979. From 1980 to 1985, the number of students enrolled at two-year programs varied between 115 (2.43%) to 153 (3.23%) while those at four-year programs ranged from 428 (9.05%) to 684 (14.46%).

Also of interest are the trends as well as the peaks, cliffs, and valleys in the enrollment figures for traditional students. College and university enrollments

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6 Because panel results are measured by the calendar year and not by the academic year, it is more accurate to use 1974 as base year and 1977 as the finishing year. Students who had enrolled at a four-year institution in the fall of 1972 and planned to earn a degree were more than likely enrolled at any time in 1974. Moreover, using 1974 allows us to exclude those who withdrew early and to include those students who transferred in from community colleges. Similarly, those completing school by the fall of 1976 probably did not report enrolling at a 4-year institution at any time in 1977. The 1709 students who "finished" college by this measure underestimates the 1774 who had reported completion by the fall of 1976, as it assumes that all students that had left between 1972 and 1974 probably did so to withdraw. Total 2-year and 4-year college enrollment decreased from 4723 in 1972 to 3816 in 1974, a net drop of 907 students. Of those, we theorize that a minority had managed to complete a college degree within two years, probably with AP credit or other means of acceleration.

(including two-year and graduate programs) peaked in 1972, with 4731 students (100% of the sub-group), and decreased with each year, with 87.38% enrolled in 1973, 80.91% in 1974, 71.83% in 1975, 48.48% in 1976, 45% in 1977, and 36.09% in 1978. Breaking down enrollment by type of institution, we find that four-year college and university enrollments peaked at 3434 (72.59%) in 1972, with the next highest years being 1974 (3291, 69.59%), 1973 (3104, 65.61%), and 1975 (3096, 65.44%) in that order. The outlier is 1974, which we suspect is due to transfers from two-year institutions. Otherwise, college and university enrollments for a given year were always lower than that of the previous year. The cliffs, where enrollments dropped abruptly from one year to the next, occurred in 1976 (1820, 38.47%), 1977 (1582, 33.44%), 1978 (1150, 24.31%), 1979 (993, 20.99%), and 1980 (684, 14.46%), after which enrollments declined gradually from 636 (13.44%) in 1981 to 428 (9.05%) in 1985. These abrupt changes are probably due to students finishing their college degrees, with some taking much longer than others and thus resulting in their dates of completion being staggered within this five-year period.

Enrollments at two-year institutions also peaked in 1972 (1289, 27.25%) and continued to decrease yearly from 1973 (1026, 21.69%) to 1978 (209, 4.42%). Thereafter, a flip-flop pattern emerged, with enrollments increasing in 1979 (245, 5.18%), dropping in 1980 (115, 2.43%), increasing in 1981 (124, 2.62%) and 1982 (143, 3.02%), falling again in 1983 (135, 2.85%), then rising in 1984 (145, 3.06%) and 1985 (153, 3.23%). No obvious reasons were found to explain this pattern, although it is interesting to note that it occurs so late, perhaps reflecting the re-enrollment decisions of those who had initially dropped out by 1973 and were probably frustrated by the limited employment and advancement opportunities for high school graduates. The major cliffs occurred in 1973 (1026, 21.69%), 1974 (525, 11.10%), and 1975 (262, 5.54%), presumably due to transfers to four-year institutions.

Vocational schooling never represented a large portion of the enrollment figures, with the peak years occurring in 1974 (105, 2.22%), 1979 (132, 2.79%), and 1978 (116, 2.45%) in that order. Enrollments were below 2% for the rest of the years before 1980, while they dropped to 1% or below for the years 1980 through 1986.

Graduate or professional school enrollments were below 1% in the years before 1976, then jumped to 259 (5.47%) in 1976, growing to 337 (7.12%) and 348 (7.36%) in 1977 and 1978 respectively, then decreasing slightly to 330 (6.96%) in 1979. The sudden rise in 1976 is due largely to students finishing their college degrees. The only major cliff occurred in 1980, as enrollments dropped to 189 (3.99%) and steadily declined thereafter.

Most students who deferred did not enroll at all in the meantime, and only a small minority enrolled in vocational or other schooling in 1972 (97, 18.20%) and 1973 (31, 5.82%). They were likely to defer for only a year, as 360 (67.54%) chose to enter an academic institution in 1973. The remaining 173 (32.46%) entered the following year.

Despite the high initial enrollment, the drop-out rate for deferring students was much higher than that for traditional students. Nearly 32.5% of those enrolling in 1973 dropped out by 1973. This represented 117 students or 21.95% of the total subgroup population. Like traditional students, most who dropped out did not enroll at any type of institution, and only 10.25% of those leaving college entered vocational schools. More disheartening is that the total drop-out pool more than doubled by 1974, with 265 (49.71%) enrolled at vocational schools or not enrolled at all.

This figure remained fairly stable throughout the next two years, with those out of college representing 50.84% (271) and 47.28% (252) in 1976 and 1977 respectively. In the years that followed, the proportion of those not enrolled in an academic program rose dramatically from 63.03% (336) in 1978, to 69.04% (368) in

1979, 77.86% (415) in 1980, 78.61% (419) in 1981, 83.49% (445) in 1982, 85.18% (454), in 1983, and 84.43% (450) in 1984, and 90.99% (485) in 1985. This sudden rise after 1977 may reflect degree completion. Looking at Panel 5.7 data, we see that only 2.10% (10) of deferring students completed college by October 1976, while that number rose to 21.76% (116) by October 1979.

As noted in Figure 5.2a, the majority of those entering in 1973 chose two-year institutions over four-years colleges and universities. Table 5.1p shows the margins between four-year and two-year enrollments for the three subgroups applicable. For 1973, the margin was 4.5% in favor of two-year institutions. However, the number of students enrolled after 1973 followed the same general pattern for traditional students, with four-year enrollments far outpacing two-year enrollments in the earlier years. Notably different were the more rapid decrease in the margin for deferring students and the surprising increase in 1985 and 1986. More importantly, the margin remained positive after 1974, reflecting the tendency for deferring students to complete degrees at four-year institutions, despite the fact that most had enrolled initially at two-year institutions.

For non-traditional students, vocational schools played a much more important role in the earlier years, with a greater percentage enrolling than any other subgroup. Nearly 18% (116) entered in 1972, compared to 12.95% (69) for those who deferred and 11.61% (227) for those who never enrolled in college. This differential between the vocational enrollment percentage for non-traditional students and the next highest subgroup grew from 5.01% in 1972 to 7.24% in 1973. From then, it declined, reaching 5.01% in 1974, 1.68% in 1975, and -0.46 in 1976.

Enrollments for undergraduate institutions peaked in 1978 and 1979, with two-year enrollments at 18.42% (119) and 20.59% (133) and four-year enrollments at 20.90% (135) and 21.05% (136) respectively. Graduate and professional enrollments peaked earlier, with 1.39% (9) attending in 1977 and 1978.

What is surprising is the close correspondence between two-year and four-year enrollments in any given year. Unlike the other subgroups where the margin between four-year and two-year institutions is initially large and almost always positive, non-traditional students attend both types of institutions in fairly equal numbers. Looking at Table 5.1p, we see that non-traditional students have margins that range between +2.5% and -3.00% and are, without question, the lowest. Furthermore, over half the years have negative values, a striking difference from traditional and deferring students.

Two explanations are offered: first, most non-traditional students probably do not transfer from two-year to four-year institutions; and second, the non-completion rate for four-year institutions may be very high in comparison to that at two-year institutions. Both of these factors reduce the margin, but do so in slightly different ways. Low transfer rates directly affect enrollments at four-year institutions by preventing the "echo" effect of two-year enrollments. A high enrollment at two-year institutions in one year would yield a lower margin for that period, but would normally result in rising enrollments at four-year institutions for the next two to three years as students transfer to finish their college degrees. Margins would increase greatly in the next two to three years not only because of rising four-year enrollments but also because of the sudden drop in the number of two-year students.

For students who are already enrolled, non-completion rates reflect the relative length of time that they spend at their institutions. High non-completion rates are equivalent to high rates of withdrawal; thus, the greater the number of students who complete their degrees, the more time we would expect them to spend at school relative to those who drop out, and the greater the number of students we would hope to find enrolled at any given point in time. Equivalently, the higher the rate of non-completion, the less time any student will spend at school, and the fewer the number of students we would expect to find enrolled at any given moment. If, for a

given subgroup, the rates of non-completion are much higher at four-year institutions than at two-year institutions, then, holding all other things constant, we would predict that the margin would decrease relative to the other subgroups where the rates of non-completion were less skewed against four-year institutions.

In examining the lack of transfers to four-year institutions, we note that the characteristic signs for such a phenomenon are lacking here. The sudden drop in two-year enrollments coupled with an uncharacteristic rise in four-year enrollments that occurred in the traditional subgroup does not occur here. Table 5.1p reinforces this fact. Whenever [1] a large number of students enroll in both two-year and four-year institutions at approximately the same time and [2] a large portion of two-year enrollments feed into four-year enrollments, we would expect to see the margin between the two types of institutions (four-year over two-year) to rise dramatically two or three years after the initial wave of enrollment, as it does for traditional students in 1974 and 1975 and for deferring students in 1975, 1976, and 1977. Only a faint echo of this effect shows up in the data for non-traditional students, as the margin becomes less negative in 1976 and 1977 and peaks out at 2.48% in 1978. As the magnitude of the margin is very small, we conclude that the percentage of students transferring from two-year to four-year institutions must be very slight.

To determine the non-completion rates for two-year and four-year institutions, we need to look at initial enrollment data from Figures 5.1, 5.2 and 5.3 as well as educational attainment data from Panel 5.7. From the figures, we see that 55 students were enrolled at four-year institutions in 1975, 52 in 1976, 33 in 1977, 36 in 1978, 29 in 1979, and 13 in 1980. From Panel 5.7, we gather that only 25 students completed a four-year college degree by October 1979. Using these figures, we can estimate the rate of non-completion for four-year students:

For 1976, 92 students were enrolled at 4-year institutions, 52 were first-timers, so 40 were returning from the year before. With 55 enrolled in 1975 and only 40 returning, a net of 15 students must have withdrawn.

For 1977, 114 students were enrolled, 33 were first-timers, and thus 81 were returning. With 92 enrolled in 1976 and only 81 returning, a net of 11 students must have withdrawn.

For 1978, 135 students were enrolled, 36 were first-timers, and thus 99 were returning. With 114 enrolled in 1977, a net of 15 must have withdrawn.

For 1979, 136 students were enrolled, 29 were first-timers, and thus 107 were returning. With 135 enrolled in 1978, a net of 28 must have withdrawn.

For 1980, 80 students were enrolled, 13 were first-timers, and thus 67 were returning. With 136 enrolled in 1979, a net of 69 must have withdrawn.

The total withdrawing was 138 while the total completing a degree by the fall of October 1979 was 25. The ratio 25/138 yields a completion rate of 18.12%; equivalently, the ratio 113/138 yields a non-completion rate of 81.88%.

The same approach is used to compute the non-completion rate for two-year students:

For 1976, 98 students were enrolled at 2-year institutions, 58 were first-timers, so 40 were returning from the year before. With 74 enrolled in 1975 and only 40 returning, a net of 34 students must have withdrawn.

For 1977, 116 students were enrolled, 48 were first-timers, and thus 68 were returning. With 98 enrolled in 1976 and only 68 returning, a net of 30 students must have withdrawn.

For 1978, 119 students were enrolled, 40 were first-timers, and thus 79 were returning. With 116 enrolled in 1977, a net of 37 must have withdrawn.

For 1979, 133 students were enrolled, 42 were first-timers, and thus 91 were returning. With 119 enrolled in 1978, a net of 28 must have withdrawn.

For 1980, 97 students were enrolled, 20 were first-timers, and thus 77 were returning. With 133 enrolled in 1979, a net of 56 must have withdrawn.

The total withdrawing was 185 while the total completing a two-year degree by the fall of October 1979 was 127. The ratio 127/185 yields a completion rate of 68.65%; equivalently, the ratio 58/185 yields a non-completion rate of 31.35%.

By using the net withdraws, this procedure actually underestimates the "real" number of students withdrawing for any given year and subsequently overestimates the "real" rates of completion. This occurs because the actual number of students withdrawing in any given year is masked by the number re-enrolling. Thus, an equal

number of students returning and withdrawing would result in zero net withdrawals for the year. Moreover, this procedure further underestimates the number of students withdrawing from four-year institutions, since enrollment figures in any given year do not filter out transfers from two-year institutions. After excluding first-timers, the number of students enrolled are assumed to be returning from the previous year. However, the actual rates may vary only slightly from those computed here. More importantly, the value in computing these rates of completion lie not in their absolute magnitude but in their relation between one subgroup and another.

Even so, the results clearly indicate that non-completion rates for non-traditional students are skewed against four-year institutions. Applying this procedure to the other subgroups, we find that find that completion rates between two-year and four-year institutions favor the latter, with rates for traditional students being much higher overall.[7]

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7 The computation (for Table 2.17) is as follows:

Traditional students, two-year institutions:
For 1973, 1026 students were enrolled. With 1289 enrolled in 1972, a net of 263 must have withdrawn.
For 1974, 525 students were enrolled. With 1026 enrolled in 1973, a net of 501 must have withdrawn.
For 1975, 262 students were enrolled. With 525 enrolled in 1974, a net of 263 must have withdrawn.
For 1976, 215 students were enrolled. With 262 enrolled in 1975, a net of 47 must have withdrawn.
For 1977, 210 students were enrolled. With 215 enrolled in 1976, a net of 5 must have withdrawn.
For 1978, 209 students were enrolled. With 210 enrolled in 1977, a net of 1 must have withdrawn.
For 1979, 245 students were enrolled. With 209 enrolled in 1978, a net of 36 must have entered.
For 1980, 115 students were enrolled. With 245 enrolled in 1979, a net of 130 must have withdrawn.

The total withdrawing was 1174 while the total completing a degree by the fall of October 1979 was 1050. The ratio 1050/1174 yields a completion rate of 89.44% or equivalently, a non-completion rate of 10.56%.

Traditional students, four-year institutions:
For 1973, 3104 students were enrolled. With 3434 enrolled in 1972, a net of 330 must have withdrawn.
For 1974, 3291 students were enrolled. With 3104 enrolled in 1973, a net of 187 must have entered.
For 1975, 3096 students were enrolled. With 3291 enrolled in 1974, a net of 195 must have withdrawn.
For 1976, 1820 students were enrolled. With 3096 enrolled in 1975, a net of 1276 must have withdrawn.
For 1977, 1582 students were enrolled. With 1820 enrolled in 1976, a net of 238 must have withdrawn.
For 1978, 1150 students were enrolled. With 1582 enrolled in 1977, a net of 432 must have withdrawn.
For 1979, 993 students were enrolled. With 1150 enrolled in 1978, a net of 157 must have withdrawn.
For 1980, 684 students were enrolled. With 993 enrolled in 1979, a net of 309 must have withdrawn.

The total withdrawing was 2750 while the total completing a degree by the fall of October 1979 was 2733. The ratio 2733/2750 yields a completion rate of 99.38% or equivalently, a non-completion rate of 0.62%.

Deferring students, 2-year institutions:
For 1974, 204 students were enrolled, 87 were first-timers, so 117 were returning from the year before. With 191 enrolled in 1973 and only 117 returning, 74 must have withdrawn.

For 1975, 104 students were enrolled . With 204 enrolled in 1974, a net of 100 must have withdrawn.
For 1976, 69 students were enrolled. With 104 enrolled in 1975, a net of 35 must have withdrawn.
For 1977, 62 students were enrolled. With 69 enrolled in 1976, a net of 7 must have withdrawn.
For 1978, 58 students were enrolled. With 62 enrolled in 1977, a net of 4 must have withdrawn.
For 1979, 54 students were enrolled. With 58 enrolled in 1978, a net of 4 must have withdrawn.
For 1980, 29 students were enrolled. With 54 enrolled in 1979, a net of 25 must have withdrawn.

The total withdrawing was 249 while the total completing a degree by the fall of October 1979 was 177.
The ratio 177/249 yields a completion rate of 71.08% or equivalently, a non-completion rate of 28.92%.

Deferring students, four-year institutions:

For 1974, 210 students were enrolled at, 84 were first-timers, so 126 were returning from the year before.
With 167 enrolled in 1973 and only 126 returning, 41 must have withdrawn.
For 1975, 164 students were enrolled. With 210 enrolled in 1972, a net of 46 must have withdrawn.
For 1976, 184 students were enrolled. With 164 enrolled in 1975, a net of 20 must have entered.
For 1977, 171 students were enrolled. With 184 enrolled in 1976, a net of 13 must have withdrawn.
For 1978, 126 students were enrolled. With 171 enrolled in 1977, a net of 45 must have withdrawn.
For 1979, 96 students were enrolled. With 126 enrolled in 1978, a net of 30 must have withdrawn.
For 1980, 80 students were enrolled. With 96 enrolled in 1979, a net of 16 must have withdrawn.

The total withdrawing was 171 while the total completing a degree by the fall of October 1979 was 116.
The ratio 116/171 yields a completion rate of 67.84% or equivalently, a non-completion rate of 32.16%.

Panel 5.2

The tables in Panel 5.2 describe the gender and racial composition of all the subgroups. Traditional students were split fairly evenly along gender lines, with women representing 51.24% of the total. This was comparable to the 47.9%-to-52.1% distribution in the original NLS dataset, which was designed to reflect the national population of high school seniors in 1972.[8] A large majority (84.87%) of the traditional students were white, while the remaining 15.13% was composed of blacks (7.91%), Hispanics (3.59%), Asian-Americans (1.65%), Other (1.56%), and American-Indians (0.42%). Interestingly, these figures were at the extremes for our study, with percentages for traditional whites and Asian-American being the highest of any subgroup, and percentages for blacks, Hispanics, American-Indian, and other minorities being the lowest.

Students who deferred tended to be men more often than women. Although the percentages were fairly close at 52.16% to 47.84%, this represented a net change of 3.4% from the traditional student distribution. A fundamental reason may be military service, which affects males predominantly, if not exclusively. The percentage of blacks and other minorities were the highest of any subgroup at 11.82% and 4.13%, and represented a difference of 3.91% and 2.57% from the lowest figures.

Non-traditional students provided a striking difference, as gender composition shifted dramatically away from a slight majority of men to an overwhelming majority of women. Over 60% of non-traditional students were female, while only 40% were male, representing a 3:2 ratio. Moreover, this was the highest female percentage of any subgroup. Also notable was that a larger percentage of American-Indians, Hispanics, and Asian-Americans enrolled as non-traditional students than they did as

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8 NLS-72 Fifth Follow-Up Codebook, p. 181.

deferring students. The percentage of blacks and other minorities dropped, however, more than offsetting the total numerical increase in minorities.

The majority of non-goers were women, although the percentage was a bit lower than that for non-traditional students as the distribution was 56.52% female and 43.48% male. Like traditional students, this subgroup was filled with extremes, though in the opposite direction. Non-goers included the largest percentage of American-Indian and Hispanic students as well as the lowest percentages for white and Asian-American.

Viewing student classification by gender, we find that the majority of men (62.55%) and women (58.03%) enrolled at traditional institutions. Men tended to defer more often while women were more likely to be non-traditional students. Despite the fact that female enrollment as deferring and non-traditional student was higher (15.51% to 14.4%), the rise was too small to offset the lower percentage of women initially enrolling as traditional students. Thus, the percentage of women who never enrolled was higher at 26.45% versus 23.05% for men, a difference of 3.40%.

From the perspective of race, we note that an overwhelming majority of Asian-Americans (83.87%) and whites (62.45%) enrolled as traditional students. A slight majority of blacks (52.38%) also entered college in 1972, while only a fraction of Hispanics (44.74%) and other minorities (40.88%) did so. The fewest to enter as traditional students were American-Indians, whose 29.41% rate of enrollment was overshadowed by a large (54.41%) rate of non-attendance.

Students who deferred represented only a fraction of each group, with the lowest rate exhibited among Asian-Americans (3.23%) and the highest among blacks (8.82%) and other minorities (12.15%). The total difference between the highest and lowest percentages was 8.92%, a figure somewhat higher than the 5.94% difference for non-traditional students, where the lowest rate was again among Asian-

Americans (5.38%) and the highest among Hispanics (11.32%) and American-Indians (10.29%).

As mentioned before, the highest rates of non-enrolling students were among American-Indians (54.41%), followed by Hispanics (35.79%) and blacks (29.27%). The margin between the highest and lowest rates was an astounding 46.98%, due mainly to the low rate for Asian-Americans (7.53%).

Difference Between 4-year and 2-year Enrollments
(as a percentage of the total subgroup population)
Calendar Years 1972-1986

Table 5.1p

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Traditional	45.34	43.92	58.46	59.90	33.93	29.00	19.89	15.81	12.03	10.82	8.71	7.91	6.26	5.82	3.49
Deferred 1-2 yrs	0	-4.50	1.13	11.26	21.57	20.45	12.76	7.88	9.57	8.26	7.12	4.31	1.50	1.87	2.63
Non-Traditional	-0	0	0	-2.95	-0.93	-0.31	2.48	0.46	0.15	0.46	1.55	-1.09	-0.77	-0.77	-2.16

Note: All values are expressed as percentages of the total subgroup population, which is 4731 for traditional, 533 for deferring, and 646 for non-traditional students.

Rates of Completion and Non-Completion
Between 2-year and 4-year Institutions
(by student classification)

Table 5.1q

October 1979	Two-Year Institutions		Four-Year Institutions	
	Completion Rate	Non-Completion Rate	Completion Rate	Non-Completion Rate
Traditional	89.44%	10.56%	99.38%	00.62%
Deferred 1-2 yrs	71.08%	28.92%	67.84%	32.16%
Non-Traditional	68.65%	31.31%	18.12%	81.88%

Note: Completion is defined as earning either a 2-year of 4-year degree. All values are expressed as percentages of the net total withdrawing, which are 1174 and 2750 for 2-year and 4-year traditional students respectively, 249 and 171 for deferring students, and 185 and 138 for non-traditional students.

Panel 5.2
Sample Characteristics

Table 5.2a

Gender by student classification	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Male	2307	*48.76*	278	*52.16*	253	*39.16*	850	*43.48*	3688	*46.89*
Female	2424	*51.24*	255	*47.84*	393	*60.84*	1105	*56.52*	4177	*53.11*
Total Responding	4731	*100.00*	533	*100.00*	646	*100.00*	1955	*100.00*	7865	*100.00*

Table 5.2b

Student classification by gender	Male Num	%	Female Num	%	Total Resp. Num	%
Traditional	2307	*62.55*	2424	*58.03*	4731	*60.15*
Deferred 1-2 yrs	278	*7.54*	255	*6.10*	533	*6.78*
Non-Traditional	253	*6.86*	393	*9.41*	646	*8.21*
Never enrolled	850	*23.05*	1105	*26.45*	1955	*24.86*
Total Responding	3688	*100.00*	4177	*100.00*	7865	*100.00*

Table 5.2c

Race by student classification	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
American Indian	20	*0.42*	4	*0.75*	7	*1.08*	37	*1.89*	68	*0.86*
Asian-American	78	*1.65*	3	*0.56*	5	*0.77*	7	*0.36*	93	*1.18*
Black	374	*7.91*	63	*11.82*	68	*10.53*	209	*10.69*	714	*9.08*
Hispanic	170	*3.59*	31	*5.82*	43	*6.66*	136	*6.96*	380	*4.83*
White	4015	*84.87*	410	*76.92*	507	*78.48*	1497	*76.57*	6429	*81.74*
Other	74	*1.56*	22	*4.13*	16	*2.48*	69	*3.53*	181	*2.30*
Total Responding	4731	*100.00*	533	*100.00*	646	*100.00*	1955	*100.00*	7865	*100.00*

Table 5.2d

Student classfication by race	Amer. Indian Num	%	Asian Num	%	Black Num	%	Hispanic Num	%	White Num	%	Other Num	%	Total Resp. Num	%
Traditional	20	*29.41*	78	*83.87*	374	*52.38*	170	*44.74*	4015	*62.45*	74	*40.88*	4731	*60.15*
Deferred 1-2 yrs	4	*5.88*	3	*3.23*	63	*8.82*	31	*8.16*	410	*6.38*	22	*12.15*	533	*6.78*
Non-Traditional	7	*10.29*	5	*5.38*	68	*9.52*	43	*11.32*	507	*7.89*	16	*8.84*	646	*8.21*
Never enrolled	37	*54.41*	7	*7.53*	209	*29.27*	136	*35.79*	1497	*23.29*	69	*38.12*	1955	*24.86*
Total Resp.	68	*100.00*	93	*100.00*	714	*100.00*	380	*100.00*	6429	*100.00*	181	*100.00*	7865	*100.00*

Panel 5.3

In Panels 5.3 through 5.6, we try to ascertain how various factors affect the student's decision to enroll. Panel 5.3 focuses on specifically on financial constraints centered around the family and includes survey results for three similar questions spanning a period of eight years. These were extracted from a series of questions asked in the NLS dataset in the fall of 1972, 1973, and 1979. In this case, the 1979 series has highest response rates and thus is best at reflecting the results for the different subgroups. The earlier series, however, are useful in providing proxies for these results.

Tables 5.3a and 5.3b are based on questions targeting students who had not enrolled in an academic program after high school. As most traditional students have enrolled in 1972, we would expect few responses, if any, to the series in 1972 and 1973. Thus, it may seem problematic that 50 (1.06%) responded in Table 5.3a and 7 (0.15%) in Table 5.3b. The explanation lies in the fact that Table 5.3a is based on a series of questions that was asked in October of 1972, well before the end of the calendar year. Data from subsequent follow-ups had determined that these students had indeed enrolled in an academic program, probably one that began in the latter months of 1972.

We suspect that those answering Table 5.3b were more than likely college drop-outs who withdrew without completing a semester or quarter of college and without earning college credits. Despite the fact that they had initially enrolled in an academic program, these students considered themselves equivalent to those who had never enrolled at all, for the purposes of answering these questions. The fact that the number represents less than 1/5 of 1% of the total traditional student population

makes this highly plausible, as this is much smaller than the actual number of drop-outs.[9]

For the traditional students that had not yet enrolled by October 1972, financial obligations to the family were not a significant factor in their postponing enrollment. Most (92%) answered that this reason did not apply. As family obligations are usually very difficult to resolve in the span of a few months, the fact that it applies to so few of them seems to make a lot of sense. Furthermore, we suspect that the two who dropped out to support their families in 1973 were more than likely two of the four who had answered in 1972.

Family obligations in the fall of 1972 was cited most often by non-traditional students (13.58%) and least often by deferring students (5.74%), for a margin of 7.84%. Excluding traditional students (as noted above, this is probably a special case), the margin between the highest and lowest among the remaining three subgroups dramatically narrowed to only 0.21%. Deferring, non-traditional, and non-enrolled students all had responses in the neighborhood of 17.5%.

By the fall of 1979, the percentage of those citing family obligations rose for these three subgroups, though at different rates, with the net increase highest for non-enrolled students (31.97%) and lowest for deferring students (9.59%). Moreover, an important linear relationship emerged between student classification and the percentage of those responding in the affirmative. Going from left to right in Table 5.3c, we see that traditional students were at the low end of the range with 24.40%, followed by deferring students at 27.17%, non-traditional students at 33.67%, and finally by non-enrolled students at the high end of the range with 49.34%.

This seems to indicate that the ability to enroll at a college or university right after high school is linked with the ability to pursue further education in the future.

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9 Educational attainment data from Table 16.1 shows that as of October 1976, 259 traditional students had put high school as their highest level of education. These are probably drop-outs, as all 259 had enrolled at a college or university in 1972.

Thus, traditional students, as the ones who have the least trouble entering college in 1972, are also the ones who are the least burdened by family obligations seven years later in 1979. Deferring students, who experience greater difficulties in enrolling early, but nevertheless managed to enroll within two years of graduation, tend also to have greater difficulties later. Following the same logic, we would expect non-traditional students, who are able to enroll only after 1975, to have more problems than deferring students, but fewer troubles than those who are non-enrolled (for whom the problems were insurmountable).

Panel 5.3
Impact of Family Constraints on Enrollment

Table 5.3a
Fall 1972

Needed to Earn Money to Support Family	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Applies to me	4	*8.00*	14	*5.74*	11	*13.58*	13	*8.33*	42	*7.91*
Does not apply to me	46	*92.00*	230	*94.26*	70	*86.42*	143	*91.67*	489	*92.09*
Total Responding	50	*100.00*	244	*100.00*	81	*100.00*	156	*100.00*	531	*100.00*

Q: "What are your reasons for not continuing with your education after high school?"

Table 5.3b
Fall 1973

Needed to Earn Money to Support Family	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Applies to me	2	*28.57*	16	*17.58*	52	*17.51*	184	*17.37*	254	*17.47*
Does not apply to me	5	*71.43*	75	*82.42*	245	*82.49*	875	*82.63*	1200	*82.53*
Total Responding	7	*100.00*	91	*100.00*	297	*100.00*	1059	*100.00*	1454	*100.00*

Q: "What are your reasons for not continuing with your education after high school?"

Table 5.3c
Fall 1979

Family obligations prevent further education	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Is true for me	1093	*24.40*	138	*27.17*	203	*33.67*	892	*49.34*	2326	*31.44*
Is not true for me	3387	*75.60*	370	*72.83*	400	*66.33*	916	*50.66*	5073	*68.56*
Total Responding	4480	*100.00*	508	*100.00*	603	*100.00*	1808	*100.00*	7399	*100.00*

Q: "In considering your further education, which of the following statements are true?"

Panel 5.4

The five tables in Panel 5.4 describe the impact of personal financial factors on the student's decision not to enroll. Tables 5.4a, 5.4b, 5.4d, and 5.4e are based on questions centered on academic education in general, while Table 5.4c focuses explicitly on four-year college degrees. Interestingly, the results for Table 5.4c are only slightly lower than that for Table 5.4b, symbolizing that most who needed to earn money were planning to attain the most expensive form of education. The results were identical for traditional students at 36%, while the response for deferring students dropped from 41.60% to 32.39%. The figures were slightly higher for non-traditional and non-enrolled students at 33.75% (from 29.27%) and 25.16% (from 24.52%) respectively. This is probably due to the framing of the questions, as Table 5.4a asks explicitly about the need to earn money (i.e., the economic ability to attend) while Table 5.4c poses the inquiry on the "affordability" of education in the context of other activities (that is, the economic feasibility of going to college). We suspect that conflicting activities and priorities were a much greater problem for non-traditional and non-enrolled students. In light of the economic demands of these plans, a four-year college education was more often "unfeasible" rather than "unaffordable."

As shown in Table 5.4b, the majority of traditional students (57.14%) who dropped out from college cited personal financial factors as a motivation for withdrawing. For deferring students who had not yet enrolled, a similar percentage (58.70%) reported that as a primary reason. Both non-traditional and non-enrolling students showed higher percentages in 1973, with rates of 38.38% and 29.82% respectively.

The important linear relationship between student type and ability to enroll emerges again in the results for Tables 5.4d and 5.4e. In both cases, traditional

students were the least likely while non-enrolled students were the most likely to cite personal financial difficulties in the pursuit of further education. Over all rates in 1974 ranged from a low of 31.31% to a high of 41.37%, for a margin of 10.06%. This decreased slightly to 7.82% in 1979, although the percentages for each subgroup were higher, with the response for traditional students rising to 40.80% and that of non-enrolling students reaching 48.72%. Non-traditional students were near the tail end of the spectrum in both years, with 37.19% citing personal financial difficulties in 1974 and 47.10% in 1979.

Panel 5.4
Impact of Personal Financial Constraints on Enrollment

Table 5.4a
Fall 1972

Need to earn money for education	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Applies to me	18	*36.00*	104	*41.60*	24	*29.27*	38	*24.52*	184	*34.26*
Does not apply to me	32	*64.00*	146	*58.40*	58	*70.73*	117	*75.48*	353	*65.74*
Total Responding	50	*100.00*	250	*100.00*	82	*100.00*	155	*100.00*	537	*100.00*

Q: "What are your reasons for not continuing with your education after high school?"

Table 5.4b
Fall 1973

Need to earn money for education	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Applies to me	4	*57.14*	54	*58.70*	114	*38.38*	317	*29.82*	489	*33.52*
Does not apply to me	3	*42.86*	38	*41.30*	183	*61.62*	746	*70.18*	970	*66.48*
Total Responding	7	*100.00*	92	*100.00*	297	*100.00*	1063	*100.00*	1459	*100.00*

Q: "What are your reasons for not continuing with your education after high school?"

Table 5.4c
Fall 1972

Could not afford 4-yr college education	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Applies to me	18	*36.00*	80	*32.39*	27	*33.75*	39	*25.16*	164	*30.83*
Does not apply to me	32	*64.00*	167	*67.61*	53	*66.25*	116	*74.84*	368	*69.17*
Total Responding	50	*100.00*	247	*100.00*	80	*100.00*	155	*100.00*	532	*100.00*

Q: "What are your reasons for not continuing with your education after high school?"

Table 5.4d
Fall 1974

Probably can't afford further education	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
My reason	1172	*31.31*	146	*36.23*	151	*37.19*	309	*41.37*	1778	*33.55*
Not my reason	2571	*68.69*	257	*63.77*	255	*62.81*	438	*58.63*	3521	*66.45*
Total Responding	3743	*100.00*	403	*100.00*	406	*100.00*	747	*100.00*	5299	*100.00*

Q: "If you wanted to get additional education, would any of the following be reasons why you could not do so?"

Table 5.4e
Fall 1979

Financial factors prevent further education	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Is true for me	1820	*40.80*	225	*44.47*	284	*47.10*	874	*48.72*	3203	*43.50*
Is not true for me	2641	*59.20*	281	*55.53*	319	*52.90*	920	*51.28*	4161	*56.50*
Total Responding	4461	*100.00*	506	*100.00*	603	*100.00*	1794	*100.00*	7364	*100.00*

Q: "In considering your further education, which of the following statements are true?"

Panel 5.5

Panel 5.5 focuses on the impact that insufficient information and personal uncertainty have on a student's decision not to enroll in college. The first two tables in the panel center on the student's lack of awareness about academic programs. Students were asked if lack of information, perhaps about the nature of the academic program, the application process involved, deadlines, or the availability of financial aid, were a factor in their non-enrollment in 1972 and 1973. Only a minority of the students in all subgroups cited this as a primary reason, with deferring students at the high end of the spectrum at 18.70% and non-enrolling students at the bottom at 10.97%. Less than 20% of traditional students who had not enrolled by October 1972 reported this as their reason, although most probably managed to attend college in the final months of the year.

In 1973, the percentage rose only slightly for non-traditional and non-enrolled students, with rates increasing from 12.50% to 15.05% and 10.97% to 11.95% respectively. For deferring students, the percentage dropped only marginally from 18.70% to 18.48%. Much higher was the rate reported by the traditional students who dropped out, of whom 28.57% cited the lack of information as a main factor for withdrawal. Information in this case may be knowledge about the difficulty of the academic programs or the quality of the social life at institution the student entered in 1972; or it may be about the availability of financial aid at other institutions the student thought were out of reach and thus had not applied to.

Looking only at the latter three subgroups, we find an downward linear relationship between student type and response rate for both 1972 and 1973. Deferring students consistently cited information reasons more often than non-traditional and non-enrolled students. Moreover, non-traditional students had higher rates than non-enrolled students. Intuitively, this makes sense, as we would expect

information to play a relatively small role (with respect to other factors), in influencing the enrollment decisions of non-traditional and non-enrolled students.

Tables 5.5c and 5.5d delve with the different issue of personal uncertainty. Both tables are based on similar questions asked in the fall of 1979, with the first focusing on the subject and the latter on the outcome of further education. An upward linear relationship between student type and response rates is evident in the results of these two tables. Traditional students were at the lower end of the range, with 27.11% and 22.08% for Tables 5.5c and 5.5d respectively, while non-enrolled students established the peaks at 39.03% and 33.09%. In general, figures for Table 5.5c were significantly higher than those for Table 5.5d, signifying that students were less certain about the specifics of their studies (i.e., the actual coursework) than about the employment outcomes of their education.

Panel 5.5
Impact of Insufficient Information or Personal Uncertainty on Enrollment

Table 5.5a
Fall 1972

Failed to find out details in time	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Applies to me	9	*18.00*	46	*18.70*	10	*12.50*	17	*10.97*	82	*15.44*
Does not apply to me	41	*82.00*	200	*81.30*	70	*87.50*	138	*89.03*	449	*84.56*
Total Responding	50	*100.00*	246	*100.00*	80	*100.00*	155	*100.00*	531	*100.00*

Q: "What are your reasons for not continuing with your education after high school?"

Table 5.5b
Fall 1973

Failed to find out details in time	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Applies to me	2	*28.57*	17	*18.48*	45	*15.05*	126	*11.95*	190	*13.09*
Does not apply to me	5	*71.43*	75	*81.52*	254	*84.95*	928	*88.05*	1262	*86.91*
Total Responding	7	*100.00*	92	*100.00*	299	*100.00*	1054	*100.00*	1452	*100.00*

Q: "What are your reasons for not continuing with your education after high school?"

Table 5.5c
Fall 1979

Not sure what I want to study	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Is true for me	1212	*27.11*	150	*29.76*	188	*31.23*	699	*39.03*	2249	*30.53*
Is not true for me	3258	*72.89*	354	*70.24*	414	*68.77*	1092	*60.97*	5118	*69.47*
Total Responding	4470	*100.00*	504	*100.00*	602	*100.00*	1791	*100.00*	7367	*100.00*

Q: "In considering your further education, which of the following statements are true?"

Table 5.5d
Fall 1979

Not sure what occupation to pursue	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Is true for me	989	*22.08*	135	*26.79*	173	*28.98*	592	*33.09*	1889	*25.63*
Is not true for me	3491	*77.92*	369	*73.21*	424	*71.02*	1197	*66.91*	5481	*74.37*
Total Responding	4480	*100.00*	504	*100.00*	597	*100.00*	1789	*100.00*	7370	*100.00*

Q: "In considering your further education, which of the following statements are true?"

Panel 5.6

The tables in Panel 5.6 address the importance of academic ability in determining student non-enrollment. The first six tables focus on the college admissions process, while the last three ask questions concerning future education. For the most part, the percentage of students responding in the affirmative was fairly low for all subgroups, with rates generally below 10% for all the tables. This signifies that academic ability was generally not as important a factor in influencing non-enrollment as other reasons, such as personal and family financial constraints.

The first two tables focus on poor high school grades and admissions scores, with Tables 5.6a and 5.6b reporting on the results for the falls of 1972 and 1973 respectively. As expected, traditional students had the lowest rates by far. This results from their definition as students who had been able to enroll in college during the 1972 calendar year. The one exception in Table 5.6a probably enrolled in the latter months of 1972, after the survey question had been asked. For non-traditional students, the rates of affirmative response were below that of the non-enrolled but above those for deferring students. These were 5.06% and 9.70% for 1972 and 1973 respectively. For deferring, non-traditional, and non-enrolled subgroups, rates increased slightly between the two years.

The lack of high school credits for college entrance was less of a factor, as the highest responses reported were a 5.16% in 1972 and a 6.35% in 1973, both for non-enrolled students. This is expected, as nearly all the students in the NLS dataset have matriculated from high school and have completed graduation requirements that are usually tailored to the entrance requirements for the local colleges. Traditional students had fairly low rates, with 2.04% in 1972 and 0% in 1973. Surprisingly, non-traditional students had the lowest rate in 1972 (0%) and the second lowest in 1973 (4.04%). As the figures and Panel 5.1 had shown that non-traditional students

tended to enroll more at two-year at institutions, this result is consistent and reflects the more open admissions policies for community colleges.

Complete rejections from the schools the student had applied was even less of a factor, as most responses were less than 2% in Tables 5.6e and 5.6f. The only exception were the deferring students, who had a 6.52% rate in 1973.

Much more interesting are the number of students who reported not being qualified for additional education in 1974. Non-enrolled students were at the top of the range, with a rate of 14.56% while deferring students clinched the bottom, at 6.53%. The total margin in this case was 8.03%.

Next in Tables 5.6h and 5.6i, we find the results for two similar questions asked in the Fall of 1979. Both deal with the inability to pursue further education, but for different reasons, with Table 5.6h focusing on insufficient background and Table 5.6i on insufficient ability. Interestingly, an increasing linear relationship emerges between student type and the rate of response. Once again, traditional students were the most able to pursue further education, with only 3.62% and 2.46% citing these reasons as problems. Non-traditional students were near the top of the range with rates of 8.01% and 5.70% respectively. At the top were non-enrolled students, with rates of 15.48% and 10.61%.

Panel 5.6
Impact of Academic Ability on Enrollment

Table 5.6a
Fall 1972

Poor HS grades or admission scores	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Applies to me	1	*2.04*	14	*5.71*	4	*5.06*	16	*10.32*	35	*6.63*
Does not apply to me	48	*97.96*	231	*94.29*	75	*94.94*	139	*89.68*	493	*93.37*
Total Responding	49	*100.00*	245	*100.00*	79	*100.00*	155	*100.00*	528	*100.00*

Q: "What are your reasons for not continuing with your education after high school?"

Table 5.6b
Fall 1973

Poor HS grades or admission scores	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Applies to me	0	*0.00*	8	*8.70*	29	*9.70*	109	*10.35*	146	*10.06*
Does not apply to me	7	*100.00*	84	*91.30*	270	*90.30*	944	*89.65*	1305	*89.94*
Total Responding	7	*100.00*	92	*100.00*	299	*100.00*	1053	*100.00*	1451	*100.00*

Q: "What are your reasons for not continuing with your education after high school?"

Table 5.6c
Fall 1972

Lack of HS credits for college entrance	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Applies to me	1	*2.04*	3	*1.23*	0	*0.00*	8	*5.16*	12	*2.27*
Does not apply to me	48	*97.96*	241	*98.77*	80	*100.00*	147	*94.84*	516	*97.73*
Total Responding	49	*100.00*	244	*100.00*	80	*100.00*	155	*100.00*	528	*100.00*

Q: "What are your reasons for not continuing with your education after high school?"

Table 5.6d
Fall 1973

Lack of HS credits for college entrance	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Applies to me	0	*0.00*	5	*5.49*	12	*4.04*	67	*6.35*	84	*5.79*
Does not apply to me	7	*100.00*	86	*94.51*	285	*95.96*	988	*93.65*	1366	*94.21*
Total Responding	7	*100.00*	91	*100.00*	297	*100.00*	1055	*100.00*	1450	*100.00*

Q: "What are your reasons for not continuing with your education after high school?"

Table 5.6e
Fall 1972

Applied to one or more schools, not accepted	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Applies to me	0	*0.00*	3	*1.22*	1	*1.25*	5	*3.23*	9	*1.70*
Does not apply to me	49	*100.00*	242	*98.78*	79	*98.75*	150	*96.77*	520	*98.30*
Total Responding	49	*100.00*	245	*100.00*	80	*100.00*	155	*100.00*	529	*100.00*

Q: "What are your reasons for not continuing with your education after high school?"

Table 5.6f
Fall 1973

Applied to one or more schools, not accepted	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Applies to me	0	*0.00*	6	*6.52*	4	*1.35*	18	*1.71*	28	*1.93*
Does not apply to me	7	*100.00*	86	*93.48*	293	*98.65*	1035	*98.29*	1421	*98.07*
Total Responding	7	*100.00*	92	*100.00*	297	*100.00*	1053	*100.00*	1449	*100.00*

Q: "What are your reasons for not continuing with your education after high school?"

Table 5.6g
Fall 1974

Not qualified (low grades/ test scores)	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
My reason	436	*11.72*	26	*6.53*	45	*11.19*	107	*14.56*	614	*11.68*
Not my reason	3284	*88.28*	372	*93.47*	357	*88.81*	628	*85.44*	4641	*88.32*
Total Responding	3720	*100.00*	398	*100.00*	402	*100.00*	735	*100.00*	5255	*100.00*

Q: "If you wanted to get additional education, would any of the following be reasons why you could not do so?"

Table 5.6h
Fall 1979

Insufficient background for further education	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Is true for me	162	*3.62*	20	*3.94*	48	*8.01*	277	*15.48*	507	*6.88*
Is not true for me	4316	*96.38*	487	*96.06*	551	*91.99*	1512	*84.52*	6866	*93.12*
Total Responding	4478	*100.00*	507	*100.00*	599	*100.00*	1789	*100.00*	7373	*100.00*

Q: "In considering your further education, which of the following statements are true?"

Table 5.6i
Fall 1979

Insufficient ability for further education	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Is true for me	110	*2.46*	18	*3.56*	34	*5.70*	190	*10.61*	352	*4.77*
Is not true for me	4368	*97.54*	488	*96.44*	563	*94.30*	1601	*89.39*	7020	*95.23*
Total Responding	4478	*100.00*	506	*100.00*	597	*100.00*	1791	*100.00*	7372	*100.00*

Q: "In considering your further education, which of the following statements are true?"

Panel 5.7

The last panel in this chapter reports on the educational attainment of the four subgroups at three different points in time: October 1976, October 1979, and October 1986. Results for the first two tables are very accurate, while those for the last are good approximations for the four subgroups, as there exist a fair number of students who were somehow skipped in the 1986 survey question. As mentioned before in Panel 5.1, drop-outs did occur for the traditional and deferring subgroups. This we can see by the number of students who reported only high school or vocational experience by 1976. For traditional students, these amounted to 392 or approximately 8.29% of the total subgroup population. This was significantly higher for deferring students at 150 or 28.14% of the total. By 1979, however, most of these managed to re-enroll in college, so percentages for both subgroups fell, with traditional students reaching 1.82% (86) and deferring students dropping almost 20% to 9.76% (52). The percentage of those completing four-year college degrees rose for both subgroups, with 2733 (57.77%) of traditional students finishing degrees by 1979 as compared to 1774 (37.50%) in 1976. The increase was far more dramatic for deferring students, as 116 (21.76%) completed degrees by 1979, a far cry from the 10 (1.87%) in 1976.

For traditional students, the percentage who had some college experience rose from 129 (19.96%) in 1976 to 441 (68.27%) in 1979. Unlike the traditional and deferring subgroups, more non-traditional students completed two-year degrees than four-year degrees by 1979, with the rates being 19.66% (127) and 3.87% (25) respectively. The largest portion of non-traditional students (289, 44.74%) had some college experience, but had not completed a degree.

Non-enrolled students, as expected, largely did not have any college experience at all, although a fair number did manage to enroll at vocational schools. The only

exception are the 26 students (1.33%) who had managed to earn college credits by 1979, although they had never enrolled at a college. Nearly 14% (267) of the population had vocational experience by 1976. This rate rose to 29.87% (584) by October 1979.

Panel 5.7
Educational Attainment

Table 5.7a

Educational attainment as of October 1976	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
High school	259	*6.00*	106	*22.27*	331	*56.10*	1552	*84.86*	2248	*31.16*
Less than 2 yrs vocational	82	*1.90*	26	*5.46*	102	*17.29*	199	*10.88*	409	*5.67*
2 yrs or more vocational	54	*1.25*	18	*3.78*	28	*4.75*	68	*3.72*	168	*2.33*
Less than 2 yrs college	544	*12.60*	149	*31.30*	107	*18.14*	8	*0.44*	808	*11.20*
2 yrs or more college	1606	*37.18*	167	*35.08*	20	*3.39*	2	*0.11*	1795	*24.88*
Finished college	1774	*41.07*	10	*2.10*	2	*0.34*	0	*0.00*	1786	*24.76*
Total Responding	4319	*100.00*	476	*100.00*	590	*100.00*	1829	*100.00*	7214	*100.00*

Table 5.7b

Educational attainment as of Oct 1979	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
No college no voc	56	*1.18*	33	*6.19*	112	*17.34*	1345	*68.80*	1546	*19.66*
No college some voc	30	*0.63*	19	*3.56*	93	*14.40*	584	*29.87*	726	*9.23*
< 2 yrs college no voc	318	*6.72*	83	*15.57*	111	*17.18*	26	*1.33*	538	*6.84*
< 2 yrs college some voc	231	*4.88*	98	*18.39*	178	*27.55*	0	*0.00*	507	*6.45*
2-yr deg 2+ years no voc	599	*12.66*	89	*16.70*	52	*8.05*	0	*0.00*	740	*9.41*
2-yr deg 2+ yrs some voc	451	*9.53*	88	*16.51*	75	*11.61*	0	*0.00*	614	*7.81*
4-5 yr degree	2733	*57.77*	116	*21.76*	25	*3.87*	0	*0.00*	2874	*36.54*
Advanced degree	308	*6.51*	5	*0.94*	0	*0.00*	0	*0.00*	313	*3.98*
Missing	5	*0.11*	2	*0.38*	0	*0.00*	0	*0.00*	7	*0.09*
Total Responding	4731	*100.00*	533	*100.00*	646	*100.00*	1955	*100.00*	7865	*100.00*

Table 5.7c

Educational attainment as of Oct 1986	Traditional Num	%	Deferred Num	%	Non-Trad Num	%	Non-Goer Num	%	Total Resp. Num	%
Some high school	0	*0.00*	0	*0.00*	0	*0.00*	5	*0.26*	5	*0.06*
High school diploma	2	*0.04*	0	*0.00*	0	*0.00*	65	*3.32*	67	*0.85*
2+ years vocational	1	*0.02*	1	*0.19*	2	*0.31*	161	*8.24*	165	*2.10*
Some college	1077	*22.76*	244	*45.78*	432	*66.87*	0	*0.00*	1753	*22.29*
College graduate	2047	*43.27*	115	*21.58*	69	*10.68*	0	*0.00*	2231	*28.37*
Master's degree	676	*14.29*	33	*6.19*	10	*1.55*	0	*0.00*	719	*9.14*
Ph.D M.D. etc.	256	*5.41*	8	*1.50*	3	*0.46*	0	*0.00*	267	*3.39*
Missing	45	*0.95*	6	*1.13*	6	*0.93*	7	*0.36*	64	*0.81*
Legitimate Skip	627	*13.25*	126	*23.64*	124	*19.20*	1717	*87.83*	2594	*32.98*
Total Responding	4731	*100.00*	533	*100.00*	646	*100.00*	1955	*100.00*	7865	*100.00*

Chapter 6

Concluding Remarks

The non-traditional student has come to play an important part in our higher education system. Yet, we, as administrators and educators--people whose lives are linked to our higher education system--have only a cursory understanding of who these students are and what their motivations may be. To better serve them and to be well prepared for the changes that may follow, we need to a greater understanding of this recent phenomenon. It is hoped that this thesis has been able both to uncover some insights and to shed some light on further avenues for research.

In attempting to establish a framework for empirical study, we first had to take a few difficult steps in defining these non-traditional students. Earlier in this work we noted that this is not a very simple task. As the literature shows, each study seems to define "non-traditional" in different terms. Some base it purely on age or enrollment status; others on prior life experience. What we strived for was a functional definition that, although not perfect, would help us focus roughly on the type of person we wanted to study. This turned out to be high school graduates who had at least deferred three years before attending college. Singling out students in this way allowed us to establish comparison groups, which in this case were "traditional," "temporary deferment," and "non-enrolling."

Our empirical analysis first focused on variables or factors we thought would be instrumental in the non-traditional student's enrollment decision. Some of these were based on factors touched upon in the enrollment literature, although most of these references primarily focused on traditional students. Among the criteria tested were personal characteristics, family background, aptitude and ability, life experience, and attitudes. Through probit analysis, which contrasted the non-traditional and

non-enrolling subgroups to see which variables tended to be statistically linked with enrollment, we found that many, but not all of our initial variables were significant. Among these were race, gender, aptitude, attitude, and military experience. Many of our family background variables turned out have slight significance.

The next step in our analysis was to construct descriptive statistics for comparison between the three subgroups. Dates of first-time enrollment and yearly enrollment activity were both broken down by institution type. It turns out that the longer a student defers, the less likely he or she is to enroll at a four-year institution. Moreover, degree completion takes longer and is less successful (in terms of imputed rates).

Other qualities looked at included personal characteristics such as race and sex; family and personal financial constraints; lack of information and guidance as well as personal uncertainty; and academic ability. The results were at times mixed, but some trends did emerge, as response rates for certain kinds of questions increased consistently with longer deferments while others decreased consistently.

The results of our analysis seem to point to more questions than answers. This is probably as it should be for a relatively untouched area of research. In particular, it would be interesting to undertake similar empirical work with other longitudinal datasets as they become available. With the (hopeful) release of the latest follow-up survey of High School & Beyond, comparable analysis could be undertaken to see if the underlying characteristics of non-traditional students have changed significantly between the high school graduates of 1972 and 1980.

The availability of National Post-Secondary Aid Survey (NPSAS) data for 1987 and 1990 opens up some interesting research possibilities in the area of financial support and aid. Do non-traditional students defer because they do not receive, are not eligible, or perceive themselves to be ineligible for sufficient financial aid?

Other possibilities exist for researching the high school graduate's decision to postpone college entrance. Could this be linked in any way to current labor market conditions? Are non-traditional students more goal-oriented than other types of students? Do they put employment considerations as a higher priority in their educational pursuits, especially in course selection and choice of major? Does college enrollment really offer the means for upward mobility that non-traditional students seek (any more than it does for traditional students)? Is it a viable means for career changing?

Really, the questions are limitless, especially in a field that has been relatively unscathed by the current higher education research. This may explain why Freeman and Holloman's comment about our "limited knowledge" stands so defiantly nearly twenty years later. Perhaps we'll be able to prove them sorely wrong by end of the next twenty.

APPENDIX A

The National Longitudinal Study of the High School Class of 1972

Excerpts from Contractor Report
Center for Education Statistics

Office of Educational Research and Improvement
U.S. Department of Education

The CES's Longitudinal Studies Program: Overview

The mandate of the Center of Education Statistics, formerly the National Center for Education Statistics (NCES), includes the responsibility to "collect and disseminate statistics and other data related to education in the United States" and to "conduct and publish reports on specific analyses of the meaning and significance of such statistics."

Consistent with this mandate and in response to the need for policy-relevant, time-series data on nationally representative samples of high school students, CES instituted the National Education Longitudinal Studies (NELS) program, a continuing long-term project. The general aim of the NELS program is to study longitudinally the educational, vocational, and personal development of high school students and the personal, familial, social, institutional, and cultural factors that may affect that development.

The overall NELS program utilizes longitudinal, time-series data in two ways: (1) each of several cohorts is surveyed at regular intervals over a span of years, and (2) comparable data are obtained from successive cohorts, permitting studies of trends relevant to educational and career development and societal roles. Thus far, the NELS program consists of three major studies: The National Longitudinal Study of the High School Class of 1972 (NLS-72), High School and Beyond (HS&B), and the National Education Longitudinal Study of 1988 (NELS:88).

The first major study, NLS-72, began with the collection of comprehensive base year survey data from approximately 19,000 high school seniors in the spring of 1972. The NLS-72 first follow-up survey in the spring of 1973 added to the sample nearly 4,500 individuals who did not participate at the time of the base year survey. Three more follow-up surveys were conducted in the fall and winter of 1974, 1976,

and 1979, using a combination of mail surveys and personal and telephone interviews.

The second major survey, HS&B, was designed to inform Federal and State policy in the decade of the 1980s. HS&B began in the spring of 1980 with the collection of base year questionnaire and test data on over 58,000 high school seniors and sophomores. The first follow-up survey was conducted in the spring of 1982, and the second follow-up survey in the spring of 1984. The HS&B third follow-up survey was conducted concurrently with the NLS-72 fifth follow-up in the spring and summer of 1986.

The four survey cohorts (the NLS-72 seniors, the HS&B seniors and sophomores, and the NELS:88 8th graders) are displayed in Figure 1, according to their actual or planned survey years and their modal age at the time of each survey. As shown, the NLS-72 seniors were first surveyed in 1972 at age 18 and have been resurveyed five times since, with the last survey occurring in 1986 when these young adults were about 32 years of age. The HS&B cohorts have been surveyed at points in time that would permit as much comparison as possible with the time points selected for NLS-72. This design makes possible three types of comparison.

First, the three cohorts can be compared on a time-lag basis (inter-cohort or intergenerational). For example, the high school seniors of 1972 and the high school seniors of 1980 and 1982 can be compared to determine changes over time in the composition, distribution, and needs of high school seniors.

Second, fixed-time comparisons can be undertaken. For a given year, the data collection for each cohort can be viewed as a cross-sectional study. It is possible, for example, to compare employment rates in 1986 of 22-, 24- and 32-year-olds.

The third type of analysis is longitudinal (within cohort) and is designated in Figure 1 by the diagonal lines. Because the history of the age cohort can be taken

into account and modeled, analyses can be designed that isolate school and program effects from the effects of differential life experiences.

The History of NLS-72

In 1968, NCES conducted a survey to determine the specific data needs of educational policy makers and researchers. Respondents to the survey expressed a need for data that would allow comparisons of student educational and vocational experiences with later outcomes. This finding provided the impetus for CES to begin planning for the first of an intended series of national longitudinal studies.

The Base Year Survey

Following an extensive period of planning, which included the design and field test of survey instrumentation and procedures, the base year survey was initiated in the spring of 1972. The sample design called for a deeply stratified national probability sample of 1,200 schools with 18 seniors per school, school size permitting. A total of 19,001 students from 1,061 high schools provided base year data on up to three data collection forms: a Test Battery, a School Record Information Form, and a Student Questionnaire. The student questionnaire was completed by 16,683 seniors.

The First Follow-up Survey

The first follow-up survey was conducted from October 1973 to April 1974. Added to the base year sample were 4,450 1972 high school seniors from 257 additional schools that did not participate earlier. The addition of this group was meant to compensate for school nonresponse in the base year. First follow-up forms were mailed to 22,654 students and obtained from 21,350 by mail, telephone interview, or personal interview. Sample members were asked about their location in October 1973 and what they were doing with regard to work, education, and/or training. Similar information was requested for the same time period in 1972 to facilitate tracing of respondents' progress since they left high school and to define the factors that might have affected that progress. Retrospective information on some base year variables was requested from those added to the sample at this time. The first follow-up sample retention rate among the 16,683 seniors completing the base year questionnaire was 93.7 percent.

The Second Follow-Up Survey

The second, follow-up survey was conducted from October 1974 to April 1975, with forms mailed to 22,364 sample members. The information requested was similar to that in the first follow-up, but for the new time point, with some new questions regarding work and education included. Concurrent with the second follow-up, a special retrospective survey was conducted (using an Activity State Questionnaire) to obtain key activity status information about prior time points from those who had not provided this information previously. Second follow-up questionnaires were obtained from 20, 872 sample members by mail, telephone interview, or personal interview. Among the 21,350 persons who completed the first follow-up questionnaire, sample retention rate for the second follow-up was 94.6 percent.

The Third Follow-Up Survey

The third follow-up survey was conducted from October 1976 to May 1977. Third follow-up forms were mailed to 21,807 sample members, and 20,092 third follow-up questionnaires were obtained by mail, telephone interview, or personal interview. The information collected included respondent status in October 1976, as well as for October of the intervening year (1975), and summaries of experiences and activities since the previous follow-up. The third follow-up sample retention rate for second follow-up respondents was 93.9 percent.

The Fourth Follow-Up Survey

The fourth follow-up survey was conducted from October 1979 to May 1980, with fourth follow-up questionnaires sent to 20,862 sample members and obtained from 18,630 by mail, telephone interview, or personal interview. Some 5,548 of these individuals were also asked to complete a Supplemental Questionnaire. Like the Activity State Questionnaire used in the second follow-up, this instrument was

designed to collect key work and educational history data that had been requested but not obtained in prior follow-ups. Additionally, a subsample of 2,648 persons was retested during the fourth follow-up on a subset of the base year test battery.

The fourth follow-up questionnaire requested summaries of educational and occupational activities and experience since the previous follow-up, including status at the time points of October 1977,1978, and 1979. Given the time since high school graduation for these respondents, some emphasis was placed on other activities (e.g., family formation, political participation) in the fourth follow-up instrument. Fourth follow-up sample retention among the third follow-up respondents was 90.8 percent. At the conclusion of fourth follow-up activities, a total of 12,980 individuals had provided information on all questionnaires (base year and all four follow-up studies), representing 78 percent of the 16,683 base year respondents. As a result of the various retrospective data collection efforts, the number of individuals with some key data elements for all time points is 16,450. This represents 73 percent of the 22,652 respondents who participated in at least one survey.

Standard Errors and Design Effects

Statistical estimates derived from the NLS-72 survey data are subject to sampling variability. Because the sample design for the fifth follow-up involved stratification, disproportionate sampling of certain groups, and clustered (i.e., multi-stage) probability sampling, the calculation of exact standard errors for survey estimates can be difficult and expensive. Popular statistical analysis packages such as SAS (Statistical Analysis System) or SPSS-X (Statistical Programs for the Social Sciences) normally calculate standard errors under the assumption that the data being analyzed are collected from simple random samples. The NLS-72 sample is somewhat less efficient than a simple random sample of the same size. Thus, sampling errors generated by SAS and SPSS-X will normally underestimate the

sampling variability of statistical estimates of population means, percentages, and more complex statistics like regression coefficients.

Several procedures are available for calculating precise estimates of sampling errors for data from complex samples. These procedures--Taylor Series approximation, Balanced Repeated Replication (BRR), and Jackknife Repeated Replication (JRR)--give similar numerical results but vary somewhat with respect to computational cost and convenience. To examine the statistical efficiency of the NLS-72 fifth follow-up sample, standard errors were calculated by the Taylor Series method, using a program developed by NORC. In addition to the standard errors, the design effect (DEFF) and square root of the design effect (DEFT) were calculated for each estimate. All are shown in table 3.4-1.

The design effect is a measure of the efficiency of a sample relative to a simple random sample of the same size as the actual sample. It is defined as the ratio of the actual variance of an estimate (i.e., the square of the estimate's standard error) to the variance of the same estimate from a simple random sample with and equal number of cases. For proportions, the simple random sample variance is just

$$p\,(1 - p)/n \qquad (1)$$

in which

p - the estimated proportion

n - the number of cases with non-missing data.

For percentage estimates, the proportion in this formula is merely replaced by the percentage.

APPENDIX B

High School and Beyond: 1980 Senior Cohort

Excerpts from Contractor Report
Center for Education Statistics

Office of Educational Research and Improvement
U.S. Department of Education

CES's Education Longitudinal Studies Program

The mission of the Center of Education Statistics (CES) includes the responsibility to "collect and disseminate statistics and other data related to education in the United States" and to "conduct and publish reports on specific analyses of the meaning and significance of such statistics" (Education Amendments of 1974 - Public Law 93-380, Title V, Section 501, amending Part A of the General Education Provisions Act).

Consistent with this mandate and in response to the need for policy-relevant, time-series data on nationally representative samples of high school students, CES instituted the National Education Longitudinal Studies (NELS) program, a continuing long-term project. The general aim of the NELS program is to study longitudinally the educational, vocational, and personal development of young people, beginning with their elementary or high school years, and the personal, familial, social, institutional, and cultural factors that may affect that development.

The overall NELS program utilizes longitudinal, time-series data in two ways: (1) each cohort is surveyed at regular intervals over a span of years and (2) comparable data are obtained from successive cohorts, permitting studies of trends relevant to educational and career development and societal roles. Thus far, the NELS program consists of two major studies: The National Longitudinal Study of the High School Class of 1972 (NLS-72) and High School and Beyond (HS&B). A third major study, the National Education Longitudinal Study of 1988 (NELS:88), will begin with a survey of 8th graders in 1988 and will continue with biennial follow-up surveys throughout the 1990's.

The first major study, NLS-72, began with the collection of comprehensive base year survey data from approximately 19,000 high school seniors in the spring of 1972. The NLS-72 first follow-up survey added nearly 4,500 individuals in the

original sample who did not participate at the time of the base year survey. Three more follow-up surveys were conducted with the full sample in 1974, 1976, and 1979, using a combination of mail surveys and personal and telephone interviews. The fifth follow-up survey, with a subsample of 14,489 individuals took place during the spring of 1986.

The second major survey, HS&B, was designed to inform Federal and State policy in the decade of the 1980s. HS&B began in the spring of 1980 with the collection of base year questionnaire and test data on over 58,000 high school seniors and sophomores. The first follow-up survey was conducted in the spring of 1982, the second follow-up in the spring of 1984, and the third follow-up in the spring of 1986.

The four survey cohorts (the NLS-72 seniors, the HS&B seniors and sophomores, and the NELS:88 8th graders) are displayed in figure 1 according to their initial and subsequent survey years and their modal age at the time of each survey. As shown, the NLS-72 seniors were first surveyed in 1972 at age 18 and have been resurveyed four times since, with the last survey occurring in 1979 when these young adults were about 25 years of age. The HS&B cohorts have been surveyed at points in time that would permit as much comparison as possible with the time points selected for NLS-72. In particular, three types of comparison are possible.

First, the three cohorts can be compared on a time-lag basis (inter-cohort or intergenerational). For example, the high school seniors of 1972 and the high school seniors of 1980 and 1982 can be contrasted to determine changes over time in the composition, distribution, and needs of high school seniors.

Second, fixed-time comparisons can be undertaken. For a given year, the data collection for each cohort can be viewed as a cross-sectional study. It is possible, for example, to compare employment rates in 1986 of 22-, 24- and 32-year-olds.

The cohorts can be analyzed longitudinally (diagonal lines in figure 1). Because the history of the age cohort can be taken into account and modeled, analyses can be designed that isolate educational effects from the effects of differential life experiences.

HS&B and NLS-72

High School and Beyond was designed to build on the NLS-72 in three ways. First, the base year survey of HS&B included a 1980 cohort of high school seniors that was directly comparable with the 1972 cohort. Replication of selected 1972 student questionnaire items and test items made it possible to analyze changes that occurred subsequent to 1972 and their relationship to recent Federal policies and programs in education. Second, the introduction of a sophomore cohort provided data on the many critical educational and vocational choices made between the sophomore and senior years in high school, permitting a fuller understanding of the secondary school experience and its impact on student. Finally, HS&B expanded the NLS-72 focus by collecting data on a range of lifecycle factors, such as family-formation behavior, intellectual development, and social participation.

History of High School and Beyond

The Base Year Survey

The base year survey was conducted in spring 1980. The study design provided for a highly stratified national probability sample of over 1,100 secondary schools as the first stage units of selection. In the second stage, 36 seniors and 36 sophomores were selected in each school (in schools with fewer than 36 students in either of these groups, all eligible students were included). Special efforts were made to identify sampled students who were twins or triplets so that their co-twins or co-

triplets could be invited to participate in the study. (Data from non-sampled twins and triplets are not included in the student data files, but are available in a separate Twin Data File, which links questionnaire data from the base year and first follow-ups for sampled and non-sampled twins for special analyses.) Over 30,000 sophomores and 28,000 seniors enrolled in 1,015 public and private high schools across the country participated in the base year survey.

The student questionnaires focused on individual and family background, high school experiences, work experiences, and plans for the future. The student identification pages included information that would be useful in locating the students for future follow-up surveys, as well as a series of items on the student's use of, proficiency in, and educational experiences with languages other than English. The cognitive tests measured verbal and quantitative abilities in both cohorts. In addition, the sophomore test battery included achievement measures in science, writing, and civics, while seniors were asked to respond to tests measuring abstract and nonverbal abilities. Of the 194 test items administered to the HS&B senior cohort in the base year, 86 percent were identical to items that had been given to the NLS-72 base year respondents.

School questionnaires, which were filled out by an official in each participating school, provided information about enrollment, staff, educational programs, facilities and services, dropout rates, and special programs fro handicapped and disadvantaged students. The teacher comment checklist provided teacher observations on students participating in the survey. The parent questionnaire elicited information about how family attitudes and financial planning affected postsecondary educational goals.

The First Follow-up Survey

The first follow-up sample consisted of approximately 30,000 1980 sophomores and 11,995 1980 seniors. It retained the multi-stage, stratified, and

clustered design of the base year sample. Among sophomores, all students who had been selected for inclusion in the base year survey, whether or not they actually participated, had a chance of being included in the first follow-up sample. Weighting was employed to compensate for unequal probabilities of selection. A subsample of 11,500 students was selected from among the senior cohort base year participants (see chapter 3). This subsampling was carried out to ensure adequate analytic power to address policy issues in areas such as excellence in education, access to postsecondary education, need for financial aid, and the impact of education on career choices. A special sample of 495 students was selected from among those 1980 seniors who had been selected for inclusion in the base year survey but who had not actually participated.

The first follow-up survey of the senior cohort also included all non-sampled co-twins and co-triplets who had been identified and surveyed during the base year, provided that the sampled twin or triplet was retained for the follow-up. However, non-sampled twins and triplets were not included in the probability sample and were not weighted. Their data appear only on a separate Twin Data File (see chapter 1).

As in the base year survey, there was a Hispanic supplement in the first follow-up survey, again supported by OBEMLA and OCR. The first follow-up survey also included a sample of students from the Department of Defense Dependents Schools (DoDDS), located overseas, but DoDDs students were not part of the main probability sample and were not weighted.

The method of data collection for the sophomore cohort was in-school group administration of questionnaires and tests. A first follow-up school questionnaire was requested of all schools selected in the base year (including those schools that had refused to participate), with three exceptions: schools that had no 1980 sophomores, schools that had closed, and schools that had merged with other schools in the sample. Schools not in the base year sample that had received en masse transfers of

students from base year schools were contacted to complete a first follow-up school questionnaire and to arrange student survey activities. Because these schools were not part of the probability sample of secondary schools they do not appear on the Updated School Data File.

First follow-up data were collected through group administrations of questionnaires and tests. The sophomore group administrations were conducted in either the sampled students' high school or an appropriate location off-campus. The location of the administration depended on the survey member's school enrollment status during the data collection period (February through May 1982). Group administrations were scheduled off-campus for sample members who were no longer attending the sampled schools. These individuals (e.g., transfer students, dropouts, early graduates) were contacted by NORC Survey Representatives and brought together in small groups of two to six participants. The same survey administration procedures were followed for both types of group administration. Follow-up ended in mid-July of 1982, after response rates of 81 and 89 percent had been obtained for the questionnaires and tests, respectively.

The Second Follow-Up Survey

The sample design for the sophomore cohort second follow-up survey was the same as that used for the first follow-up. Survey activities were initiated for all sample members except for 25 persons who were known to be deceased.

Mail-back questionnaires were the basic method of data collection. During the first week of February 1984, approximately 15,000 packets of survey materials were mailed to the last known addresses of the sample members. Two weeks later, postcards thanking respondents for their cooperation and requesting the cooperation of nonrespondents were mailed to all sample members. Two weeks after the cards were sent, trained telephone interviewers called those who had still not responded and

urged them to do so. When this failed, interviews were conducted by telephone or in person. Approximately 79 percent of the sophomore sample members mailed back their completed questionnaires; about 16 percent were interviewed by telephone; and about 5 percent were interviewed in person (see METHOD in appendix C). As in the earlier follow-up, the survey design required that respondents who were to be interviewed over the telephone or in person have a copy of the questionnaire before them during the interview to minimize bias due to method of administration. Follow-up interviewing continued through July 1984, and resulted in a completion rate of over 91 percent.

The Third Follow-Up Survey

The sophomore cohort sample for the third follow-up survey was the same as that used for the second follow-up. Again survey activities were initiated for all sample members except for 30 persons who were known to be deceased. (The non-sampled twins and triplets; however, were not surveyed during this wave).

As in the second follow-up survey, mail-back questionnaires were the basic method of data collection. During the last week of February 1986, approximately 15,000 packets of survey materials were mailed to the last known addresses of the sample members. Three weeks later, respondents who had not returned their questionnaires were sent a postcard reminder. Two weeks after the cards were sent, trained telephone interviewers called those who had still not responded and urged them to do so. When this failed, interviews were conducted by telephone or in person. Approximately 65.5 percent of the sample members mailed back their completed questionnaires; 5.8 percent were interviewed in person; and about 19.2 percent were interviewed by telephone. The survey design again required that respondents who were to be interviewed over the telephone or in person have a copy of the questionnaire before them during the interview to minimize bias due to

method of administration. Follow-up interviewing continued into September and resulted in a completion rate of 90.6 percent.

APPENDIX C

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